

The Effectiveness of a Goal-Setting Model on Behavioural Change

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Abstract

To evaluate the effectiveness of a goal-setting model on behavioural change, thirty nine adults between the ages of 23 and 73 years who were in a weight loss program were assigned to one of two groups. One group was taught to change eating behaviour using a weight-reducing diet. The other group was taught to use a goal-setting model to change behaviour. Pretest and posttest surveys were completed by all participants, and a call-back survey by the experimentals. The PET Type Check and Kolb's Learning Style Inventory were administered to all participants. As well, five of the experimentals were interviewed. Results of qualitative analyses showed no significant difference between the two groups, but qualitative research suggested that experimentals were more likely to use the goal-setting model to make behavioural changes, and that being successful increased their self-efficacy.

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As this research draws to a close, I realize how very important it is to come to closure on this portion of my life. It is time to move on, and yet I know that I am going to miss the stimulating and exciting academic pursuits which I have experienced since coming to Brock. Unlike my undergraduate programs which were highly structured in nature, this degree has afforded me plenty of opportunity to pursue my own interests. Courses were always full of refreshing and thought-provoking discussions. I will miss them. To all of those professors who have created the environment for these exhilarating learning experiences, I would like to express my heartfelt thanks.

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CHAPTER ONE: THE PROBLEM

Introduction

This research paper focuses on measuring the impact of a goal-setting model on behavioural change. The study was conducted with a population of people trying to change eating habits in a weight loss program. In the field of nutrition education, weight control (or weight loss, as the case may be) has always been a key issue and people have looked to dietitians for the answers to this problem. While theories about obesity and weight control, or strategies for successful weight loss abound, it is a problem that has never gone away (Kucamarski, Flegal, Campbell, & Johnson, 1994; Manson, Colditz, & Stampfer 1990; Williamson, Kahn, Remington, & Anda, 1990). Educators are working to develop a theory of practice that would best result in the healthy eating behaviours regarded as ideal (Olson & Kelly, 1989; Johnson & Johnson, 1985). To understand whether goal-setting as an approach to behavioural change is more effective than a conventional teacher-centered approach, this study compares a group of subjects and controls in a weight loss program using a pre- and posttest survey.

The PET Type Check (Cranton & Knoop, 1994) and the Kolb's Learning Style Inventory (Kolb, 1994) is used in this research. Personality type and preferred learning style may have a significant influence on how comfortable participants feel about participating in a program which encourages self-direction. Therefore, these tools will be used to assess the participants' preferences.

Statement of the Problem

This study is conducted within a weight loss program that has run in the Hamilton area for more than 12 years. While the goal-setting model is used in several education programs at Dairy Farmers of Ontario (DFO), only one of these programs is targeted towards an adult population. In that program, in addition to a booklet outlining the goal-setting model, consumers receive a 7-day meal plan and other resources that could influence the participants' attitudes towards the goal-setting process. Therefore, it was decided to analyze the model outside of the DFO's programs.

Less-On Lifestyles was chosen since it is a program which I taught in the past, and because the educators in that program are looking to move towards a goal-setting approach. Additionally, evaluating the model in the weight loss program allows for the opportunity to compare the experimental group to a control group who were taught to make lifestyle changes using a prescribed meal plan.

Study Purpose

This study has three components. The first is to determine whether a goal-setting model has a greater impact on an individual's success at making behavioural changes in food and activity habits than the conventional method of prescribing a diet. The second is to establish whether a relationship exists between psychological type and preferred learning style, and the success an individual experiences in applying a goal-setting approach to learning.

Rationale

The Dairy Farmers of Ontario (formerly known as The Ontario Milk Marketing Board) has been developing educational resources for approximately 20 years. Over that period of time, nutritionists employed there have sought to heighten their understanding of education theories in order to increase the effectiveness of their programs. The Dairy Council of California had an educator on staff whose job it was to improve their expertise in nutrition education. He was responsible for developing a goal-setting model to promote healthy eating behavior. In Canada, this model was first used by the B C Dairy Foundation, but soon nutritionists in Ontario became aware of it and began to incorporate it into their programs. The production of each education program requires large sums of money, yet in spite of this financial commitment, no studies have been conducted to evaluate the successfulness of the goal-setting model. Therefore, in the interest of effectiveness and efficiency, it was decided to conduct an evaluative study to measure the success rate of the goal-setting model.

Psychological type and the preferred learning style of study participants is also assessed. Recognizing what type of approach works best with what type of learning will benefit DFO. It will enable nutritionists to better position resources to maximize the effectiveness of nutrition education.

Definitions

Adult learners are individuals who are of a legal and chronological age identified as adults and, who are performing roles sanctioned by society as adult roles. They come to a

learning situation with a unique set of experiences, attitudes, and knowledge, and are looking to expand their knowledge base or acquire new skills.

Canada's Food Guide to Healthy Eating is a document developed by Health Canada which is designed to give guidelines to healthy Canadians as to the foods they should eat to remain healthy. There are more than 50 nutrients that we need daily and that need has been substantiated by scientific data. However, in order to keep track of all of them, the food guide classifies foods into food groups. We are told to have a range of servings from each food which is adequate to meet our nutrient needs.

Goal-setting model refers to the process that participants will undergo in trying to change their lifestyle habits. It involves collecting data on what they do, analyzing them to determine how it compares to a standard, identifying what they should do differently, and then implementing a goal over a period of time, and evaluating their success.

Harris Benedict Equation is a mathematical equation which is used by dietitians to estimate the total daily energy requirements of an individual. It is calculated from the factors of height, weight, age, gender, and activity level.

Nutrition education may be defined as any set of learning experiences designed to facilitate the voluntary adoption of eating and other nutrition-related behaviours conducive to health and well-being (Contento, 1995).

Prescribed meal plan refers to the way participants are normally taught to make dietary change. Typically a dietitian would calculate the calorie level that the participant needed to lose weight and would then break that value down into a number of servings from

different food groups. In the same didactic manner, other changes such as physical activity, or reduction of fat would be recommended by the dietitian.

Assumptions and Limitations

The population chosen for this study includes men and women who attended Less-On Lifestyles, a weight loss program at Chedoke-McMaster Hospitals in Hamilton. Because these people voluntarily joined the program and pay \$190.00 to join, it is assumed that they are motivated to make some changes in their eating behaviours. However, the cost of the program may create some limitations on the diversity of the group. It may well be that participants reflect a middle classes sample since they can afford to pay the fees. Hence, it may be difficult to extrapolate the findings in this study to a larger population.

With the exception of two males, the group is made up of women whose ages range from 30 and 73 years of age. As well, due to an unforeseen drop in the number of people joining the program, the number participating in the study was much lower than hoped. Consequently, the results of this study must be assumed to reflect these participants only, and cannot be generalized to reflect the population as a whole.

Outline of Remainder of the Study

The remainder of this research will be described in the following chapters. Chapter 2 will consist of a literature review as it pertains to adult learning, learning styles, Jungian theory of psychological type, health behaviour theory, nutrition education, and goal setting. Chapter 3 describes the method used including: documentation of sample selection, research design, instruments, procedures, and data collection and analysis.

Chapter 4 describes the results of the analysis. Finally, Chapter 5 includes the discussion, implications and recommendations of the study.

CHAPTER TWO: LITERATURE REVIEW

Adult Education

Adult learning is not new. But it has only been since the 1920s, that educators have sought to define it as an entity separate from the learning of children. Theorists have struggled to put a framework around adult education but it is difficult to limit the discussion to one definition.

John Dewey, a philosopher of earlier years is regarded as the father of educational reform. While he focused primarily on children, his ideas have had a profound effect on adult education. Dewey fought against the conventional wisdom which would have children sit in rows and passively absorb the knowledge of their elders. He believed that the only way to truly learn was through experience, and he set up experimental schools to validate his beliefs. Rather than have children learn about weaving by reading about it in books, Dewey would have them explore the topic from a variety of perspectives. He suggested that children preferred to learn through four different mediums: communication, inquiry, construction and through artistic expression, and pointed out that to learn through listening alone allowed little opportunity for adjustment to other capacities or demands (Dewey, 1990). First, the children would build a loom, then research the patterns of blankets woven by Indians, and then create their own patterns. Other research around spinning led to artistic work far more sophisticated than one would expect from young children.

Dewey is also credited with identifying the concept of reflective thinking as a process of thought, a concept which will be expanded on further in this thesis. Lindeman

was greatly influenced by Dewey, and wrote the first book that defined adult education (1926). He emphasized the individual's needs and experience as the starting point of adult education, and believed that self-improvement could only lead to a change in social order.

Educational psychologists have concerned themselves with the way in which we learn. Skinner is most renowned for his theory of operant learning. He proposed that to affect behavioural change, the desired end behaviour is positively reinforced by a reward immediately following it. His work is basic to many activities related to behavioural change (Dubin & Okun, 1973) and is largely teacher-centered since it is the teacher who controls the direction and the reward. With the ingenuity and control exercised in his research, Skinner has been able to influence educational practitioners of children and adults (Kidd, 1973). Competency-based training is an example of this theory where the outcome and the means for achieving it are preset. This theory is sometimes criticized because it ignores the previous experience of the learner and because learner power over what is learned is given up (Draper, 1993).

Gagne focused on the different ways in which individuals acquire learning (1970). He developed a hierarchical conceptualization of eight different types of learning. They include: signal learning, stimulus-response learning, chaining, verbal association, discrimination learning, concept learning, rule learning, and problem solving. The basic level, signal learning, can occur at any time, and the highest level, problem solving, occurs as a result of a combination of two or more lower level learning.

While Gagne and Skinner are considered two of the more significant behaviourists, it can be said that it is the humanists whose theories persist in the adult education

literature. Maslow is perhaps the most widely identified of this class of theorists. He identified a hierarchy of needs which include:

- gratification of bodily needs;
- safety against pain and danger of life;
- love and affection, warmth and acceptance;
- self-esteem, self-respect, self-confidence; feelings of strength and adequacy;
- and self-actualization, self-fulfillment, self-expression.

Maslow unlike others, did not state that one had to complete one level before moving on to others. In fact, he suggested that expression at several levels might go on throughout life. However, the more basic levels must be satisfied before an organism is able to function at a higher level. Self-actualization develops over time through the full employment of one's talents and potentials (Kidd, 1973). Jarvis (1987) contended that this hierarchy is actually a taxonomy and one that has omitted a fundamental need: the need to learn.

Carl Rogers, another humanist, was, along with Maslow, most influential on Knowles in his development of andragogy. Rogers contended that the primary goal of education was self-actualization (Rogers, 1969, cited in Dubin & Okun, 1973). He regarded the role of the teacher to be that of a facilitator. Hence he would have the instructor interacting with students in a genuine, nonjudgmental fashion. There would be an expectation of mutual respect between the instructor and students and amongst them. The learner would share the responsibility of defining the learning objectives, and criticism would be offered in a constructive manner. Clearly, his influence on Knowles was great.

Andragogy

In 1980, Malcolm Knowles published *The Modern Practice of Adult Education* in which he set out his theoretical framework for adult learning. In it, he defined adult education as andragogy, the art and science of helping adults learn. His theory was based on five assumptions regarding the characteristics of adult learners:

1. The learner is self-directing.

He supports this assertion by stating that if a person is responsible for his own life then he is self-directed. He points out that adults have a deep psychological need to be perceived by others and treated by others as capable of taking care of themselves. When we find ourselves in situations where we feel others are imposing their will on us without our participation in decision-making, we experience a feeling of resentment. Yet as self-directed as adults can be, they are inclined to abandon that independence and revert to a dependent role when placed in a “teaching “ situation.

2. Adults come to a learning situation with an accumulation of experiences which are a rich resource for learning.

Due to the different roles that adults perform: spouse, parent, co-worker, citizen, and others, they can act as resources to other adults. Hence the use of techniques that emphasize collaboration amongst groups of adults is vital. As well, the greater the adult's experience the greater is his or her self-identity. If, in a learning situation that experience is ignored and not valued, then it may be perceived by the learner as a rejection of his/her person.

3. The readiness of an adult to learn is a function of what he/she needs to know.

Often this is determined by changes in the adult's life: birth, death, marriage, divorce or a change in residence may be the catalyst for learning.

4. Adults seek out learning as they need it.

Knowles says that adults do not learn for the sake of learning but in order to perform a task, solve a problem, or to live in a more satisfying way.

5. Adults are motivated to learn by intrinsic factors.

Knowles suggests that adults are motivated to improve self-esteem, or to improve quality of life, or for a greater sense of satisfaction, but less so by extrinsic factors such as a pay increase or new job.

While adult education had been seen as different from pedagogy, Knowles' theory provided a clear platform upon which to define learning situations. This assumption base permitted adult educators to identify themselves as different from educators of children. It implied that learners came to a learning situation with their own agenda and therefore should be involved in setting the curriculum. If learners came with their reservoir of experiences, then educators would need to be sensitive to that and structure their programs to be relevant to each learner within the context of their experience. If adult learners are problem-centered, it suggested that programs be designed to meet those needs. And if adults' readiness to learn is related to the developmental tasks of their social roles, then the program should be designed to meet their real-life concerns rather than the needs of the establishment. It also meant that learners should be encouraged to look at their experiences objectively and learn how to understand them.

Knowles' theory of andragogy drew a strong response from adult educators everywhere. And not all would agree with him. Elias (1979) took exception to the idea that Knowles' assumptions were any different for children than they were for adults.

I concede that adults and children are existentially different in some ways; but I deny that they are different in ways that pertain to fundamental educational processes...with regard to modes of learning and consequently modes of teaching, I contend that there are no basic differences (p. 258).

He went on to suggest that rather than two distinct arts and sciences of teaching, there were two different approaches, and that they had been identified by Dewey as the traditional and progressive approaches.

Brookfield (1990) too, took exception to Knowles' first tenet that all adults are self-directed. As he very clearly pointed out, if that were so, then adults would not tolerate the totalitarian regimes that exist around the world.

If adults were innately self-directed in the sense of having an undeniable drive towards autonomy, then they would be impelled by this drive to challenge such regimes and to create alternatives through which they could express their independence. (Brookfield, 1990, p. 94).

Carlson threw his hat into the political arena as well (1979). He believed that the difference between andragogy and pedagogy lies in the political dimension. Children require socialization to acquire the knowledge, beliefs, and attitudes of the society and this falls under the auspices of pedagogy. However, as children become adults, the role of the educators changes to accommodate their different learning needs. Of course, he pointed

out, neither andragogy nor pedagogy is exclusive to a certain age group, but may overlap or extend into one another .

Knowles regarded pedagogy and andragogy as opposing one another in his early work. However, in time he too came to modify his stance somewhat, saying instead that andragogy and pedagogy were actually opposite ends of the same continuum and that both were appropriate at different times and regardless of the age of the learners (Knowles, 1984).

Self-Direction

Of all the assumptions that he laid out, Knowles' concept of self-direction has received the most attention. As Brookfield (1993) so adroitly pointed out, in times of recession, most industries would be in awe of the kind of growth seen in scholarly writings on self-directed learning. Every book on adult education pays homage to this concept. Yet what exactly self-directed learning is eludes definition, since it is a term used to describe a variety of concepts and practices. According to the androgogical model, self-direction is the preferred method of learning for most adults since they have a natural inclination to undertake learning projects on their own initiative (Collins, 1991). Hence, the strategies that focus on the needs and activities of the learner take center stage rather than those of the teacher who in fact, should function more as a facilitator. Some argued that self-directed learning means the independent pursuit of learning (Garrison, 1992). Still others argued that self-direction refers to independent learning projects (Tough, 1979). Kasworm (1983) described it as "a set of generic finite behaviors; as a belief system reflecting and evolving from a process of self-initiated learning activity; or as an

ideal state of the mature self-actualized learner” (p. 1, cited in Oddi, 1987). Brookfield (1993) suggests that most adult educators would probably agree that the practice of self direction dignifies and respects people and their experience and attempts to break with the more authoritarian form of traditional education.

What appears to be common to all the definitions is a sense that the learner has some personal control over either the planning or management of the learning experience. However, we cannot assume from this that all adult learners would or should become fully autonomous learners. Rather, some critical theorists suggest that collaboration between learner and teacher is a much more realistic and functional model. Garrison (1992) suggested that collaboration will likely enable learners to develop a deeper understanding of the content and will provide the opportunity to confirm knowledge objectively.

Garrison and Baynton have attempted to reflect the dynamic nature of a collaborative relationship with a transactional model that explains the relationship between independence and self-direction (Garrison, 1989). At the core of this model is the concept of control, and control refers to the opportunity and ability to influence, direct, and determine decisions related to the educational process. The three dimensions of control are: independence or the freedom to identify and choose educational goals; proficiency or the mental capability required to achieve those goals; and support or the human and nonhuman resources available to pursue the goals. Control is in dynamic balance and will increase through collaboration between teacher or facilitator and learner.

There are cases as we well know, where the learner wishes to give up some of his or her independence to get more support from the facilitator. While this may be viewed as

regressing to a role of dependence characterized by pedagogy, in fact it is not. Giving up control for greater dependence may allow the learner to achieve his or her desirable end goal. Perhaps what makes this different from the more teacher-centered learning, is the level of awareness of the learner. An adult learner who is in control of his or her learning should be making informed choices which furthers his or her self-interests. If a learner has less proficiency or support in an area, then greater dependence may be required. But as proficiency and support increase, then independence should also increase.

Collaboration was also encouraged by Knowles (1980), Rogers (1969) and by Bergevin (1969). Pratt (1988) would argue that this collaborative model where self-directed adults are able to function as such, is a transient state which is “highly dependent on the learner’s confidence, commitment and competence at a given moment in time” (p. 162).

Pratt suggested that several variables will allow adults to function in a self-directed manner. Situational variables are those conditions which prevail during learning which cannot be considered personal, psychological attributes of the learner or teacher. An example might be a program that a learner must enroll in for accreditation which is teacher or content-driven and in which the learner has no input regarding goals or methods of instruction. Teacher variables such as experience, training, personality, confidence, personal philosophy, and preferred methods of working will impact the teacher’s decision to implement collaborative methods. Most people were taught in systems that placed the teacher at the center of dominance in the classroom. If they lack the training to work in a collaborative environment, they likely will not do so.

Learner variables which will influence the establishment of collaboration include the competence, commitment, and confidence of the learners. If a learner lacks relevant knowledge, skills, commitment to a particular goal, or the self-confidence to be successful, then they are likely to require more direction and support from the teacher.

Pratt would agree with Garrison that it is entirely possible for a self-directed learner to relinquish control to the teacher because there is no real benefit to having that control. As he pointed out, it is not the control per se which matters but the ability to consider alternatives, reflect on consequences, and ultimately to choose when to exercise or relinquish control that defines self-direction.

Grow (1991) accepted the idea of learner dependence and has identified four stages of dependency of learners. He provided a model that includes four different styles of teaching that instructors could employ to influence students and move them towards greater autonomy (1991). The stages of self-direction and recommended teaching styles are as follows:

- Stage 1: (for dependent students) teaching style should be authoritative and coach;
- Stage 2: (for interested students) teaching style should be that of motivator and guide;
- Stage 3: (for involved students) teaching style should be that of facilitator;
- Stage 4: (for self-directed students) teaching style should be that of consultant and delegator.

Brookfield would be in agreement with the issue of control. He would suggest that educators start where the learner is and then move them forward towards:

...an uncomfortable and often unsought confrontation with inequitable political realities and with their own unacknowledged collusions in these realities, by grounding this process in terms and processes which look, feel, sound and smell close to home. (Brookfield, 1993, p. 230)

In other words, critical reflection was for Brookfield, the essence of the true practice of adult education. He defined six principles of effective practice in facilitating learning. They included:

1. Participation in learning is voluntary.
2. There is a mutual respect among participants for each other's self worth.
3. Facilitation is collaborative so that both learners and facilitators assume teaching and learning roles.
4. Both are involved in a continual process of action, and reflection on activity.
5. Facilitation fosters a sense of critical reflection.
6. The aim of facilitation is to nurture self-direction (Brookfield, 1986).

Critical Reflection

Critical reflection is a more recent "buzzword" in the field of education however as was mentioned earlier, it is a concept first promoted by Dewey as an aim of education (Kitchener, 1983). He can be credited with not only providing the theoretical rationale for it, but also for providing the terms commonly used in discussions around reflective thinking including critical thinking, problem solving, inquiry, and reflective judgment. Dewey defined reflective thinking as: "Active, persistent, and careful consideration of any

belief or supposed form of knowledge in light of the grounds that support it and the further conclusions to which it tends" (Dewey, 1933, p. 9).

Awareness of a problem has been identified by Dewey as the pre-reflective stage which is also the initiation of inquiry. Judgment is the arrival at a solution, but it is the period in between that he refers to as critical inquiry, and that includes six elements: 1) the immediate identification of and weighing of possible solutions; 2) a more careful identification of the specific problem; 3) the development of a supposition or hypothesis which acts as a guide to the collection of observations; 4) reasoning about apparent cases of corroboration and noncorroborating evidence; 5) the further development of better and more complete explanations; and 6) the testing of a hypothesis which may lead to formulation of a better hypothesis (Dewey, 1933).

What is clear is that critical thinking is far more than just thinking. One can be quite involved in internal dialogue, but it may not necessarily be critical. To be critical is to judge and not take things for granted. McPeck (1981, cited in Garrison, 1992) suggested that..."perhaps the most notable characteristic of critical thought is that it involves a certain skepticism, argument or suspension of assent, towards a given statement, established norm or mode of doing things" (p.6).

For Brookfield (1986) critical thinking was essential to adult education. He suggested that it takes place through five phases which start with a triggering event, which may be unexpected and that leads to discomfort in the learner. It could be precipitated by the loss of a job, death, or perhaps a positive event. It is followed by appraisal of the situation which in effect is self-exploration, and then exploration to explain anomalies.

The individual then develops alternative perspectives and integrates it into the fabric of living (Cranton, 1994; Garrison, 1992). While this model begins and ends in the external world, the middle three phases are internal. As was mentioned earlier, Brookfield saw the fostering of critical thinking as an integral part of the facilitator's role in education. In educational settings where critical thinking is fostered, learners would become aware of the forces or structures that are keeping them in a position of dependence. Brookfield's theory of practice is not unlike the theory of transformative learning developed by Mezirow, which is explained below.

Transformative Learning

Andragogy has acted as the framework upon which adult educators have hung their shingle for some time, but the approach proposed by Mezirow (1991) is equally applicable to adult learning theory. Using the philosophy of Jurgen Habermas (1971), Mezirow has adopted the concept to describe his theory of learning. He suggested that there are three domains of learning: the instrumental domain describes the cause-effect relationships between things, and is related to the acquisition of knowledge through task-oriented problem solving; the practical domain involves communicative action and deals with understanding the meaning of what others communicate regarding social norms, moral and ethical decisions, values, as well as such concepts as freedom, love, autonomy, and democracy. Emancipatory learning occurs as "emancipation from libidinal, linguistic, epistemic, institutional or environmental forces that limit our options and our rational control over our lives but have been taken for granted or seen as beyond human control" (Mezirow, 1991, p. 87).

Mezirow defined two constructs which he says describes the dimensions of making meaning in the world. They are:

- Meaning schemes are sets of related and habitual expectations governing if-then, cause-effect, and category relationships as well as event sequences. When we are thirsty, we expect a drink will quench our thirst; when it rains we expect to get wet if we go out in it. These meaning schemes are developed as a result of what we experience, and generally could be thought of as the rules for interpreting.
- Meaning perspectives are those beliefs, theories and evaluations which form structures by which we are able to assimilate new experiences. They are the underlying assumptions, which we usually acquire uncritically during childhood (although some meaning perspectives are intentionally learned) through the process of socialization (Mezirow, 1990).

We use both schemes and perspectives to order our world, however, they are also the filters which bias our interpretation of an experience. What we do or do not perceive, understand, and remember of an experience is deeply influenced by these schemes and perspectives.

Mezirow described three different types of meaning perspectives. Epistemic perspectives describe the way we use knowledge, and are influenced by the way we learn. Sociolinguistic perspectives are based on social norms and beliefs and are the product of our inculturation. Psychological perspectives refers to our self-image, our self-esteem and personality-based preferences. As Cranton (1994, p. 51) pointed out, content, process, and perspective reflection can go on in each of the three meaning perspectives.

Learning was described as the “process of making a new or revised interpretation of the meaning of an experience which guides subsequent understanding, appreciation, and action” (Mezirow, 1990, p. 1). But perhaps even more basic to learning than revising or interpreting meaning schemes, is reflecting on past experience to determine whether it fits into our current learning. Here too Mezirow distinguished, as did Dewey, between thoughtful action which requires us to think about what we already know, and critical reflection in which we reflect on underlying assumptions.

If what we learn changes the content of what we know, then this is content reflection. If what we learn changes the way we do things, then it is process reflection. When we question “why” we do things we are engaging in premise reflection. Content and process reflection will change our meaning schemes, but premise reflection will result in transforming our meaning perspectives. Changing our meaning schemes becomes emancipatory when they are transformed as a result of the reflection. More complex reflection is emancipatory when we question the premises underlying our meaning perspectives, and Mezirow saw the need for emancipation from those perspectives when they limit our options and control over our lives. The process of emancipation is a very personal one not unlike consciousness-raising (Brockett & Hiemstra 1991, p. 129).

Mezirow described perspective as:

“...the emancipatory process of becoming critically aware of how and why the structure of psycho-cultural assumptions has come to constrain the way we ourselves and our relationships, reconstituting these structures to permit a more

inclusive and discriminating integration of experience and acting upon these new understandings". (Mezirow, 1981, p. 6)

The prospect of perspective transformation begins with a "disorienting dilemma" in which old patterns of acting are no longer effective. This precipitates self-examination and a critical evaluation of one's assumptions. One begins to look outside oneself and to relate the personal experience with that of others and, subsequently, revision of meaning perspectives occurs.

Mezirow's theory can be linked to social action, and indeed, one of those who strongly influenced him was Friere (1972) who espoused social action. Friere was a Brazilian educator who saw education as part of the larger framework of social change. For him, education was never neutral, but either oppressed or liberated. He coined the term "conscientization" which paralleled Mezirow's perspective transformation. Friere referred to it as the process whereby subjects achieve a deepening awareness of the sociocultural reality that shapes their lives and of their capacity to transform that reality (1970, p. 27). As in Mezirow's theory, critical thinking, or praxis is the means by which one can move from a level of unconsciousness to a higher level of awareness.

Criticisms of Transformative Learning Theory

The first of the critical theorists to come forward to dispute Mezirow's theory were Collard and Law (1989). They first pointed out that there was a lack of a comprehensive theory of social change in Mezirow's work. They believed that the problem stems from his emphasis on the individual which cannot be reconciled with a theory of social change. The authors suggested that Mezirow painted himself into a

Habermasian corner because he relied too heavily on Habermas' work in spite of the fact that a number of flaws have been identified.

Mezirow's response to Collard and Law was to state that he saw perspective transformation as occurring in individuals, groups, or collectives. In response to the criticism of a lack of social theory, Mezirow said that he saw social action as important but certainly not the only goal of adult education. Indeed, were that so, then many of us would have to refrain from calling ourselves adult educators. Brockett & Hiemstra (1991, p. 131) saw this issue of individual versus social emphasis as a false dichotomy. They would concur with Mezirow that both are important and mutually dependent on one another.

Hart (1990) also criticized Mezirow but her concern was with the issue of power. She asserted that although Mezirow identified perspective distortions, he did so without recognizing or criticizing the economic, social, and political arrangements behind them. Mezirow would have educators foster critical reflection, but refrain from effecting political action, but Hart suggested that this was a false dichotomy and questioned the moral basis of such a commitment. Hart did not believe that the educator can be placed outside of a "power-bound and therefore distorted relational context" (P. 136) the moral high ground would have them not only criticize such power-bound relationships, but also to create new ones. However, Mezirow was clear that educators must avoid "indoctrination" which he said occurs when the educator "...tries to influence a specific action as an extension of his will..." (Mezirow, 1981, p. 20).

Clark and Wilson (1991) entered the debate with the criticism that Mezirow's theory was flawed because it failed to account for context. They suggested that he had represented the values of the white, masculine, and middle-class hegemonic class of society. While they could accept that he did, they faulted him for not acknowledging this in the first place. However, Mezirow had been quite clear from the beginning that context was critical.

No sound theory can develop without healthy dialogue amongst its stakeholders. The surprise is not that there are questions about transformative theory, but that it took so long for critical theorists to come forward with their comments. Despite these criticisms, transformative learning theory has done much to inform adult educators, and as will be shown later, this research.

Before leaving the discussion on transformative theory though, it is important to point out that it is a theory that can work hand-in-hand with self-directed learning which has come to be a central concept to adult education. To be self-directed one must be capable of critical thinking, and to be a critical thinker one must be able to be self-directed (Garrison, 1992). In his 1990 work, Brookfield discussed self-direction in two ways. On the one hand it can be described as the techniques that include "specifying goals, identifying resources, implementing strategies, and evaluating progress" (p. 47). But on the other hand it can be used to describe:

...when learners come to regard knowledge as relative and contextual, to view the value frameworks and moral codes informing their behaviors as cultural constructs,

and to use this altered perspective to contemplate ways in which they can transform their personal and social worlds. (p. 47)

Clearly Brookfield aligned the concept of self direction with that of transformative learning. And Garrison appeared to agree with such an approach. He pointed out that critical thinking begins with a self-directed learner who, in trying to deal with a dilemma, ponders it and arrives at some new perspectives. To critically reflect on these new perspectives would be a start, but the true transformation would occur when they were integrated and verified through dialogue with others. This, he said, is the true development of knowledge as opposed to the simple acquisition of information, and this rational process of reflection and discourse is what is basic to adult education.

Brookfield (1993, p. 229) argued for the connection when he points out that "...if self-direction means anything, it means that control over definitions, processes, and evaluations of learning rests with the people who are struggling to learn and not to external authorities." Perceiving adults as self-directed and capable of critical reflection also forms the basis for this research.

Psychological Type

Thus far we have not dealt with an aspect of adult education which is considered a great deal in the literature and that is -- the individual differences seen amongst adult learners. Cranton (1994) described how the process of transformative learning varies among different psychological type. Before turning to how they differ, it would help to have a sound understanding of what psychological type is. Carl Jung devoted years of work to the development of a model that would typify personality differences. His model

was concerned with the movement of psychic energy and the way in which one preferentially orients his or herself in the environment (Sharp, 1987). Jung classified people into eight different types: This includes two attitudes -- extroversion and introversion, and four functions of orientation -- thinking, feeling, sensing and intuition, all of which operate in an extroverted or an introverted way.

Introversion and extroversion describe the way an individual perceives the world. Extroverts are concerned with the objective world and have great tolerance for people, places, and things. They are usually outgoing, develop relationships easily, and are unsettled by new situations.

By contrast, introverts tend to withdraw into themselves because they are far more comfortable with their own thoughts and subjective reactions to the outside world. They prefer to stay at home or share their world with a small number of people. Jung (1953-1979, cited in Sharp, 1987) described them as having a "hesitant, reflective, retiring nature that keeps to itself, shrinks from objects and is always slightly on the defensive" (p. 13).

Whether one is extroverted or introverted is a matter of innate disposition. However, there is in everyone the capacity to be both. Hence, one may move from one attitude to the other as the situation demands. In reality, neither of these attitudes exist by themselves, but in conjunction with function. And these functions are divided between the rational ones: thinking and feeling, and the irrational ones: sensing and intuition. The four functions can appear with each of the attitudes.

The thinking function is one of logic. Thinking types stress what to them is logical and reasonable. Feeling types are also rational because they too, use a reflective, linear process to guide their judgments. It is important to realize that feeling here does not refer to affect but rather to that function whereby judgment is passed on everything that comes into the conscious mind. Sensation or sensing types experience their world through their five senses. The last function, intuition, is the process of unconscious perception. Ideas come into an intuitive's mind whole and complete without any indication about where they came from.

To describe the eight functions then, an attitude is combined with a function to produce rational functions and irrational functions. They are described below.

Rational Judgment Types

Extroverted thinking types are governed by objective data supplied by external conditions. The input, or facts and ideas they work with come from their external world, and the conclusions they draw are directed outwards. They have a tendency to elevate outer reality into a ruling principle or formula.

Extroverted feeling types use feelings to guide them in life. They are also oriented by external data and generally are in harmony with objective values. For them, "the object" is indispensable and determines the quality of the feeling (Jung, 1971, p. 354).

Introverted thinking types like "to create ideas, formulate theories, and open up new prospects or insights" (Cranton & Knoop, 1995 p. 255) and hence make good theoreticians. They love the contemplative life, and try to shut out all external influences. They neither are influenced by others nor do they seek to influence. Facts are collected

only to illustrate their ideas. If the facts don't fit with their inner images, then they are discounted.

Introverted feeling types, like the introverted thinking types for whom all ideas are of interest, the introverted feeler tends to feel all. But for these types, the world merely serves as a stimulus to generate intense inner feelings. Because the introversion tends to inhibit outward expression, they are seldom outspoken about what they feel, yet they often form the ethical backbone of a group.

Irrational Perceptive Types

The two other functions, sensing and intuitive, are called irrational because they are not governed by the power of reason. Jung also describes these functions as the perceptive functions.

Extroverted sensing types are the most well-adjusted to reality. They are drawn to things in life that excite their senses. Although these types have little patience for abstract reality, their sense of objective reality is fully developed. They are easygoing, good company and quite lovable. The phrase "real life lived to the fullest" best describes this type.

Extroverted intuitive types are also directed outward but because they are adept at perceiving things beneath the surface, they are said to have an eye for the soul. However, they may tend to see in people or things what is actually not there. These are the types who can wring every new possibility out of a situation. They rely on their sixth sense and bring their visions to life. However, they also tire easily of things and what may have seemed to be full of potential soon becomes a prison.

Introverted sensing types are dependent on the object outside them, but the sensed object takes second place to the sensing subject. The difference between this and the extroverted senser is that the extrovert would produce a painting that was extremely reflective of reality, while the introvert would paint a picture of the impression of the painting. What they hear and see undergoes considerable modification.

Introverted intuitives are peculiar types (Knoop, 1994). Ideas are drawn from the unconscious in the form of visions and images which they want to explore in fine detail. They have a capacity for smelling out the future, but their intuition is directed inward, and hence their type is often found among seers and prophets (Sharp, 1987).

According to Jungian theory, each individual has one function which they prefer to use and this will be the dominant one. In addition, there is an auxiliary function. If the dominant function is rational, then the auxiliary will be irrational. Conversely, if the dominant function is irrational, then the auxiliary will be rational.

Isobel Briggs Myers and her mother, Katherine Cook Briggs were the first to popularize Jung's work through development of the Myers-Briggs Type Indicator (MBTI). Katherine Briggs initially became interested in personality theory as a way to analyze characters in literature. Her daughter Isobel shared her mother's keen interest in personalities, and developed the MBTI as a way to evaluate personnel in the early 1940s. Between 1943 and 1957, Myers administered the test to cooperative individuals and conducted preliminary analysis and revisions to the instrument. In 1957, it was picked up by a company and trialed. However heavy criticism of the instrument resulted in the company dropping it. In 1975, Consulting Psychologists acquired the right to sell the

MBTI and since then have known tremendous success. They now sell approximately 2 million copies of the instrument annually (Pittenger, 1993).

Upon completing the MBTI, a person is scored and provided with four letters to indicate their personality type. The first letter represents the preference for extroversion or introversion; the second either one of the irrational function, intuitive or sensing; the third letter represents one of the rational functions, thinking or feeling; and the fourth letter the judgmental or perceptive.

The MBTI ignores Jung's concepts of the unconscious and its relation to dominant and auxiliary functions. The auxiliary function was extremely important to Jung. He regarded it as "less differentiated" than the dominant function but of "secondary importance" as it exerts a "co-determining influence" (Jung, 1921/1971, cited in Cranton & Knoop, 1995). The auxiliary function always complements the dominant function, and never opposes it. Hence if the dominant function is one of the rational functions (thinking or feeling) then the auxiliary must be a perceptive function (sensing or intuitive). As with the dominant function, the auxiliary function is consciously under the control of the will and thus able to motivate and guide action. Those who use the MBTI admit the lack of recognition of the auxiliary function but contend that the test must be interpreted in the larger context of Jungian theory (Pittenger, 1993). The MBTI also embellishes Jung's work by identifying the individual as being perceptive or judgmental.

The MBTI consists of a series of forced choice questions representing behavioural preferences which causes some difficulty in the way answers are interpreted. Although a continuous scale is provided for each of the four dimensions, the final value is given as a

nominal value. For example, if a person scored 12 on introversion, and 8 on extroversion, the individual would be classified as introverted, and the values in the extroversion would be ignored.

This lack of bimodality is significant. Based as it is on Jungian theory, the test should show a range of scores on all dimensions and there should be an independent mean and standard deviation. However, the midpoint between two opposing dimensions is treated as zero, an absolute boundary between them. This may affect the validity of the MBTI, and inaccurately classify an individual whose score is close to the zero point. Indeed, Howes and Carskadon (1979, cited in Pittenger, 1993) on examining the relation between the preference strength of each of the four scales and the percentage of individuals showing different type on retesting, found the greatest number of changes in type occurred when the preferences were within 15 points of a neutral score. In another test, McCarley and Carskadon (1983, cited in Pittenger, 1993) found that in a test-retest with a 5-week interval, that 50% of the subjects were reclassified on one or more scales (Pittenger, 1993). Hence the MBTI would seem to be an unstable indicator of personality.

On the basis of this validity test and others, Pittenger concluded that there was insufficient evidence to justify the claims made about the MBTI. Nor does he conclude that the test reliably proves there to be 16 unique personality types.

PET Type Check

Cranton & Knoop (1995) had come to similar conclusions about the MBTI and decided to develop another personality type test that would better reflect Jung's theory of personality and could more fairly indicate an individual's attitude, orientation and function.

Hence they developed the PET Type Check which has taken 5 years to validate and has just recently been marketed as a more valid tool to measure Jung's personality types (Cranton & Knoop, 1995).

The current version of the PET Type Check is a series of 80 statements to which users respond on a Likert scale that ranges from 1 (NO!) to 5 (YES!). Following the response, the answers are assessed and plotted on the Type Profile and the user supplied with interpretative data. The responses are assigned point values of 0 for either NO! or no answers, 1 point for yes and no answers, 2 points for yes answers, and 3 points for YES! answers. As in the MBTI, the interpretation is based on a subjective consideration of characteristics, however, what appears to make it superior to the previous test is its ability to consider the range of responses on all dimensions.

After testing and revising the test, the authors had developed a tool that contained 384 statements taken directly from Jung's Psychological Types. They tested it with 500 individuals, most of whom were teachers or health professionals. After testing for face validity and content validity, the test was revised three more times before a final version was developed. Although the authors took great pains to validate this instrument at every step, still some limitations exist. In terms of the sample used, it must be realized that it was not a random sample of the population at large. Convenience samples were used at every stage. As was mentioned, the population was comprised mainly of health professionals and teachers, most of whom were of a fairly high level of education. The interpretation by the tester must be viewed with caution since its successful interpretation would depend on how familiar the tester was with Jungian theory, and how experienced

they were in interpreting personality profiles. The value of the reinterpretation would also depend on the level of self-awareness possessed by the participants. It also must be recognized that this test is fairly new in the field of personality type testing, and much more research will be needed to ensure that it is indeed a reliable tool for use across populations.

Finally, a word must be said about the general concept of personality type testing. It is an attractive idea to assume that one can so easily pigeon-hole each individual into one of eight different types. But that idea may be far too simplistic to account for the complex personalities that exist amongst humans. Therefore the reader is cautioned to recognize this as simply a tool of classification and not something to be used as though the information is “carved in stone”. Hence, our interactions with individuals should not be governed by our interpretation of their personality type. To do so could limit our experience of those same individuals.

Nevertheless, the PET Type Check will be used to evaluate the personality type of the participants in this study. Personality type may influence how people make decisions and solve problems (Cranton, 1992). Decision-making, problem-solving, goal-setting and perspective transformation are all part of the success of behavioural change, and hence knowing personality type better explains the results of this study.

Kolb's Learning Style Inventory

As well as psychological type, learning style may enhance the understanding of the participants in this study, particularly since it has been suggested that psychological type and learning styles are closely related (Cranton, 1992).

Learning style describes the way people prefer to learn. For adult learners the concept of learning style is provocative. First of all, it focuses on the learner rather than the educator and hence raises the question of control between educators and learners (Tennant, 1988). As well, focusing on learning styles suggests that rather than learners being “good” or “bad” they are “different.” While there have been as many as 17 different learning style inventories developed, this paper will focus on the one developed by Kolb (1984).

This inventory is linked to a model of the learning process that the researchers say can classify all learners. Their model is a four-stage cycle comprised of an immediate concrete experience (CE), followed by reflective observation (RO), followed by formulation of a hypothesis or conceptualization (AC), and finally, the testing of that theory through active experimentation (AE). Kolb and Fry (1975) suggested that this process is cyclical, and that the learner might begin anywhere in the cycle. They argued that an effective learner must be able to “involve himself fully, openly, and without bias in all facets of the learning process” (p. 36). However, learners, being less than perfect, tend to prefer one stage over another.

Kolb’s Learning Style Inventory (LSI) can assess what the preferred learning style of an individual is. The inventory consists of a list of words which the respondent is asked to rank in order of how best it describes the way that individual likes to learn (Kolb & Smith, 1994). Kolb defined the four different types of learners as follows:

Convergers are learners who prefer abstract conceptualization and active experimentation. When presented with a problem, a converger likes to come quickly to a solution. They tend to prefer working with ideas over people.

Assimilators use abstract conceptualization and reflective observation to deal with a problem, and are more interested in developing theories and models. These learners are more likely to sit back and listen or read than be vocal and active.

Accommodators use concrete experience and active experimentation to solve a problem. They are the “doers” in the group who learn best by being immersed in the problem. They are the risk-takers, and prefer the trial and error approach to problems.

Divergers use concrete experience and reflective observation to problem solve. They like to generate ideas and do well in a brainstorming session. They enjoy working with people and have difficulty coming to a solution preferring as they do to explore all possibilities.

The strengths and weaknesses of these learning styles can be clarified, and career development recommended (Kolb & Smith, 1994). As was suggested earlier, it may be that knowing one's psychological type may predict one's preferred learning style (Cranton, 1992). Convergers are quite similar to extroverted thinking types who acquire facts and ideas and prefer the world of ideas to that of people. Introverted thinkers bear some resemblance to assimilators who like to take information and put it into concise logical forms and theories. They prefer the contemplative life and feel little need for real-life application of their theories. Similarly, introverted feeling types prefer independence when they learn, and can come to closure quickly. Extroverted feelers as well as

introverted and extroverted sensors most closely resemble accommodators who prefer “hands-on” experience and may rely more on others for information rather than depend on their own technical analysis. Extroverted feeling types prefer to work with others when they learn, and like to be guided by a teacher; extroverted sensing types and introverted sensing types also prefer to be taught by an expert and through active experience; (professional Effectiveness Technologies, 1994). Divergers do well in brainstorming and are able to view situations from many different points of view. This learning style shows up best amongst extroverted and introverted intuitives who prefer to learn in unstructured environments where creativity is required. Both psychological types say they enjoy independent learning, but the introverted intuitives prefer it more, hence for them, the brainstorming characteristic of divergers may not work so well. However one is inclined to slot psychological types into learning styles, it is important not to lose sight of the fact that personality characteristics are more intrinsic, while learning style is a preference and as such, is subject to change.

Some evidence exists that confirms that learners change as they mature. In a study to investigate the learning style of adult students in undergraduate nontraditional occupational educational programs, 513 adults were assessed during the first night of classes. The range in ages were 18-65, and the authors discovered that age and prior work experience influence learning styles. As well they suggested that the greatest number appeared to favor the accommodator style of learning (Dorsey & Pierson, 1984). Similarly, in assessing learning styles amongst county extension agents, Pigg, Busch, & Lacy (1980) identified 44% of their adult population as falling into the accommodator

quadrant. These researchers also felt that the tendency towards the accommodator style might be linked to the influence of the job on learning style.

Herbeson (1992) attempted to identify which personality types were more likely to be self-directed amongst a sample of undergraduate students. Using the Self-Directed Learning Readiness Scale (SDLRS), she found that those who scored high on the SDLRS were more likely to be those who scored higher on the scales for intuition and introversion on the MBTI. She concluded that sensing types (ergo accommodators?) were least likely to be self-directed and hence would require more guidance to become so.

Yet research by Thiel (1984, cited in Brookfield, 1990) contradicts this. Thiel surveyed 30 adults who were classified as successful independent learners. In other words, they were recognized as experts in their field of interest, they had been pursuing a learning activity not related to their job for more than 4 years, and they were pursuing their learning outside a formal educational institution. Thiel administered the Kolb's Learning Style Inventory to these subjects, and found that most were classified as accommodators.

As was described earlier, accommodators appear to be analogous to field-dependent learners, that is, they rely on others for their learning, and have greater difficulty in learning in the absence of an imposed structure. Yet though Thiel's subjects did rely heavily on others for their information, and did not employ abstract conceptualization abilities, they were, nonetheless, quite successful independent learners. This contradiction between Thiel and Herbeson may be due to a bias flow in the SDLRS which more correctly measures formal learning environments. The issue also may be one

of misinterpretation. Perhaps accommodators are not like sensing types at all. Whatever the case, more research is required to clarify this issue.

Criticism of Kolb's Learning Style Inventory has been levied on other counts. Jarvis (1987) questioned whether the cyclical nature of Kolb's model takes into account a learner who might experience new learning in a different series of steps. For example, he suggested that an individual studying complex mathematics may initially be involved in abstract conceptualization, and then move from there into reflection rather than active experimentation. Hence, Jarvis proposed that the cycle is not in one direction but rather may move in either direction. He also suggested that Kolb's model was "over-simple" and did not adequately reflect the different types of learning that could go on amongst learners (1988, p. 19). Tennant would concur. He too felt that the model at best describes a classification system of the various modes of learning, and felt the inventory identifies a preference for one set of words over another rather than a preference for learning.

In this research, participants were analyzed with respect to preferred learning style as well as psychological type to determine whether any relationship could be identified between the two. Cranton (1992) implied that such a relationship exists. If so, then the impact of either of these might show up amongst this group of participants in a weight loss program. On the other hand, the fact that they are not a random sample of the population but rather a voluntary group may limit the variety of learners or psychological types seen here.

Nutrition Education

While the field of education was evolving as it did, the field of nutrition was developing at the same time into the sophisticated profession that it has become. Nutrition education began as early as the 1900s, but for a very long time nutritionists saw their role as being one of disseminating information. The sense was that if people only had the correct information about eating, that knowledge would be adequate to induce change. Whitehead (1973), in a comprehensive review of 269 nutrition studies between 1900 and 1970, found that most education emphasized knowledge and comprehension, and did little to effect attitudinal and behavioural change. In 1985, Johnson & Johnson performed a meta-analysis of 303 studies and reported on the impact of nutrition education on knowledge, attitude and behaviour. Their results showed an improvement of 33% in knowledge, 14% in attitudes, and 19% in dietary practices. However, they noted a significant shortcoming in the research was a lack of a theoretical framework by which to explain what made nutrition education successful (p. S20).

Still, there has been a recent increase in the number of articles that cite a particular model or theory from a “very few” between 1980 and 1986, to 19% more recently (Nitzke & Athens, 1987; Sims, 1987). The need to prove the validity of nutrition education has never been greater. At a time when accountability is so vital to continued funding, the need for valid and effective methodologies is imperative (Hauchecorne, Barr,

& Sork, 1994). Nutritionists need answers to the very basic question: Does nutrition education work?

In order to understand how to change eating behaviours, it is necessary to have an understanding of what influences those behaviours. What, when and how people choose the foods they do is the result of a complex array of factors including: individual likes and dislikes, cultural and environmental influences, knowledge of food or lack thereof, food security, availability of foods and access to facilities to prepare it, financial resources, psychological and physical health and perhaps many more. In educating individuals, nutritionists must be aware of all of these. Needless to say the task may seem daunting.

In order to facilitate their understanding of how to best help clients, nutritionists have turned to the social sciences. In a review of nutrition education for adults, Contento and colleagues (1995), found that behavioural change strategies based on social learning theory and behavioural self-management were likely to be effective, particularly where people conducted self-assessments, learned effective behavioural alternatives for healthful eating, identified and set personal goals, monitored their progress towards goal attainment, and were provided with incentives or reinforcements. It has become clear that nutrition education must be placed in the broader context of social, political, and physical environments as well as the individual so as to change perceived norms for healthy behaviours (Contento, et. al., 1995). The model used in this research has sought to do that.

The Goal-Setting Model

Rus Shortridge was an educator who worked for the Dairy Council of California (DCC) to help improve their efforts in nutrition education. Through much research and investigation, and after discussion with a variety of educational theorists, Shortridge developed what he refers to as a motivation generating model and what has become for us the goal-setting model (Shortridge, 1985).

The model begins with the premise that people act on their values. When an individual applies efforts to his or her competencies it produces behaviour, and this is a result of acting on desires, which stem from values. As well, a person's desire to act is influenced by a perceived ability to carry out the act, or by self-efficacy. Shortridge has used as a basis for his model Rokeach's (1979) system of values theory which states that behaviour is a function of attitudes, values, and self-concept.

To explain, if one were to look at this theory in a three-dimensional model, one would show self-concept to be at the core and the most difficult to reach, with values above it, followed by attitudes and then behaviour (See Figure 1). Because behaviour is the most accessible it is also the easiest to change. For that reason, many behavioural change agents have focused on behaviours as a way to elicit change. However, Rokeach would contend that since behaviour is more subject to change than values or attitudes, and self-concept even less subject to change than values and attitudes, that lasting behavioural change must begin at the level of self-concept and work through values and attitudes (Sweeting, 1990). Self-efficacy is closely connected to self-esteem and self-concept

Self-concept simply refers to how you see yourself and it may not involve a value judgment. For example, if I see myself as a person with short hair and brown eyes, then

no judgment is connected to the view. Self-esteem refers to self-respect and does involve a value judgment. If I see myself as being too short, or overweight, then my self-concept

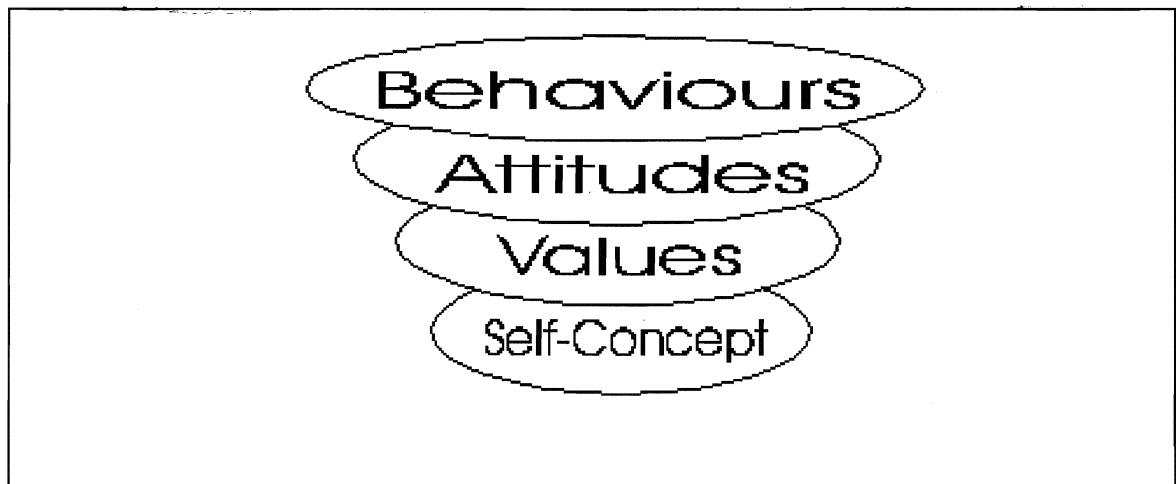


Figure 1. Rokeach's system of beliefs (Adapted from Sweeting, 1990)

does include a value judgment and may have a negative impact on my self-esteem insofar as my weight and height are concerned. Self-efficacy refers to my self-assessment of how well I might perform a certain task. If the task is an easy one like brushing my teeth then it does little for my self-esteem. If the task is a difficult one like driving a truck, then trying to drive a truck without any previous experience or learning might threaten my self-esteem because I might fear I would fail. Hence I would likely avoid the task. However, if I learned how to drive a truck by taking lessons, over time my self efficacy with regard to driving a truck would grow, which would increase my self-esteem and would result in a positive self-concept.

In a study to clarify the importance of underlying values, Rokeach (1972) worked with subjects interested in attending a smoking cessation program. Participants were asked to rank the terms "broadmindedness" and "self-discipline" on an instrumental value chart. These terms were chosen because previous studies had shown that smokers and quitters had ranked these terms differently. Smokers tended to rank broadmindedness as more valuable than self-discipline. Quitters on the other hand ranked them in reverse.

Following this ranking, subjects were asked to answer a question about whether or not they admired quitters. If they admired quitters, and were aware that quitters valued self-discipline, then they may be influenced to change their own value system. Indeed, several days later, subjects tended to reverse their ranking of the terms self-discipline and broadmindedness. And subsequently, smoking patterns decreased for up to 2 months following the treatment. The design of the study may be criticized for its lack of regard for the variety of personality types who had taken the test. Nevertheless, value

confrontation was determined to be an effective means of altering behaviour since it modifies core values (Rokeach, 1979).

Key to Shortridge's model is the idea that a person must contextualize information to fit with his or her own life. And he said, that "experiencing the difficulties and satisfactions of trying out a new action is critical to its mastery" (Shortridge, 1985, p. 4). This also fits into the idea of critical reflection that is promoted in adult learning. We must experience our world, reflect on it, consider the possible solutions, develop an hypothesis, test it, and reevaluate. Shortridge took as proof that people are goal-oriented, the fact they make plans and carry them out. And he said, people are motivated to do those things that make them feel good about themselves. Four factors were identified as influencing how an action will influence our self-concept:

1. Meaning or Relevance: If I do it will it really be of personal value to me?
2. Competence: Will I be successful in doing it?
3. Self-respect or Dignity: What effect will the action have on the respect I can expect from significant others?
4. Social Impact: Will the action affect others in a way I want? (p. 7).

While self-respect and social impact appear to be more difficult to influence, Shortridge stated that relevance and a perception of confidence are more easily influenced when it is left to the individual to determine what actions will be taken. Once again, Shortridge's philosophy is in keeping with that of adult learning, and indeed, fits the principles laid out by Knowles (1980) suggesting that adults prefer to be self-directed. He encouraged the person in the helping role to work in a collaborative relationship with their

clients by providing choices for action rather than being directive. He also said, like Knowles, that people will be more successful at making change when they are intrinsically motivated.

Shortridge borrowed from Social Learning Theory developed by Bandura (1977) when he states that

...development of competency, when the person pairs it with relevancy is key to successful behavior change. Relevancy is in the person who sees that change is something he wants because it will give him a better feeling for what he does. He sees himself as competent in acting on his expectations for doing something which causes him to feel better (Shortridge, 1985 p.10).

Social Learning Theory

Social Learning Theory (SLT) is one of the theoretical frameworks which many nutrition educators have used to design and implement programs (Contento, et. al. 1995). The theory evolves around the concept of reciprocal determinism, in which environment, person, and behaviour are continually interacting in a dynamic way. That is, each influences the others simultaneously and behaviour is dependent on the relationship amongst all three. According to SLT, the environment provides the social or physical situation within which the person must function and thus, provides the incentives or disincentives (expectancies) for the performance of behaviour (Glanz, Lewis and Rimer, 1990). Several constructs have been identified as part of the process, of learning, but those chosen by Shortridge for his model are self efficacy and outcome expectations. To reiterate, individuals are likely to engage in healthy behaviours if they believe that they can

successfully perform the behaviour (self-efficacy) required to produce the desired outcome, and if they are convinced that the outcome will benefit them (outcome expectations).

Social Learning Theory is a broad conceptual framework which has its roots in the work of Miller and Dollard as well as Hull who were attempting to explain learning among animals and humans. They regarded the person as a “black box” which emits behaviours (responses) to which reinforcements are applied by other people (Glanz et al., 1990). Reinforcements link the performance of certain responses to particular stimuli and thereby increase the likelihood of those responses. Others applied these early concepts to clinical psychology and eventually Bandura (1977) used that work as a basis for the social learning theory that exists today with several constructs. SLT has received a great deal of attention in the health care field, including nutrition. In the monograph for Society of Nutrition Educators, Contento et al. (1995) found that SLT was the basis for most of the studies done in nutrition education. As these authors pointed out, variables such as perception of the environment (situation), anticipated outcomes of behaviour (expectancies) knowledge and skills to perform the behaviour, and confidence in performing the particular behaviour (self-efficacy) are both the targets and instruments of change when clients are provided with the opportunities to learn and practice new skills (p. 289). As identified earlier, these variables can be seen in the model developed by Shortridge(1985).

To see a need to change an eating behaviour, a participant must be made aware that in a particular area of life a need for change exists. However, whether that individual

is prepared to act on new awareness really depends on whether health is valued, and whether food selection is regarded as contributing to health. If those values are in place, then recognizing the shortcomings of one's food intake may lead to dissatisfaction and the person may be more willing to incorporate changes in eating behaviours.

If clients acquire new knowledge regarding nutrition as they work through the model, then content reflection can be said to take place. If clients develop new awareness about the process for instance, of setting goals, or how to do something different (i.e., take the skin off chicken to reduce fat), then process reflection takes place. If by going through the goal-setting model, personal values regarding health are reassessed, then premise reflection can be said to have taken place, and transformative learning of the highest level has been acquired.

But what of the individual who regards health as not that important? For example, if a person values an exciting lifestyle or "getting ahead" as more important than health, the decision might be made (consciously or unconsciously) to ignore the issue of food choices. The goal-setting model does not work well with the individual who is not ready to make changes. Shortridge said that when negative motivators prevail, that people tend to seek responses such as avoidance, resignation, guilt feeling, or blocking of feelings. "Only the very tenacious seem to be able to resist succumbing to these 'outs'...and discover their own means for correcting their behaviour" (1985, p. 11).

The idea that people give up is quite realistic in the helping professions. Some may continue to resist change, and that fact points to the limitations of this model for working with anyone who is not at a stage of readiness for change.

Nevertheless, the model works well with those who are willing and open to change. Inherent in the model is the sense that the goal of education should be to increase learners' ability to function in a self-directed and independent way--a goal with which many education theorists would concur, as we have seen earlier. The way to achieve this is to put problem-solving in the hands of the learner. The methodology begins with the client recording all the foods and beverages that they consume over the course of the day. This list is then compared to a standard which could be based on factors such as nutrients, calories, fat, sugar, or any other list that might help to identify problem areas. In our programs and in the research conducted here, the standard used is Canada's Food Guide to Healthy Eating which provides recommendations for servings of food from the four food groups. The client identifies what foods are eaten in adequate amounts, and what foods must be increased in consumption. The next step is the development of a plan using the foods choices and the frequency with which they are eaten to conform to the standard.

This prepares the client for goal setting. A goal to improve eating habits must contain information about what the client expects to eat and when. Shortridge termed this a functional goal. Because the client is not required to memorize any information, the process is fairly easy. The information that is received is paired with the solutions that have been chosen by the client. This pairing is seen by the client as relevant information because it is an extension of what is already known. The information that is paired is seen to improve what the client already does, and this pairing builds confidence and a sense of competency in the client. When plans are generated by the people who are to implement them, the goals are likely to be more acceptable and more likely to be met.

The final phase of the model involves the client implementing a goal over a period of time and then evaluating the achievements. The nutrition educator can facilitate the person achieving success by acting as a consultant and posing questions that guide him or her through goal selection. This is achieved by having the client identify the conditions related to when and where the goal will be implemented. As well, discussing the barriers that might get in the way of goal achievement is vital. In this way, solutions for potential problems can be determined before they arise. To identify behavioural change, the educator must be able to answer “yes” to the questions: Does she or he make the change? Does she or he do it correctly? Will this change be maintained in the person’s lifestyle?

With the goal-setting model, clients are engaged in problem solving. This fits well with the recommendations of Whitehead (1973) who proposed that successful instructions in nutrition education create learning situations in which people recognize their own nutrition problems, see relationships between nutrition facts and their own experiences, and through active decision making and problem solving are able to generate solutions. In their review of studies which met with success, Contento et al. (1995) found that studies were likely to be successful if they were based on SLT and self-management; provided individualized interpersonal counseling and education; and emphasized personal consequences or other reinforcements relevant to the population.

The recommendations to come out of the review by Contento et. al. included nutrition education programs which are learner-centered and which address personal factors. They suggest a process in which people conduct self-assessment, learn effective

behavioural alternatives for reaching desired ends, make decisions among alternatives, set specific goals, learn the cognitive, affective and behavioural skills needed to achieve their goals, and monitor their progress toward goal attainment. They regard the ultimate goal to be empowerment of the individual.

Kent (1988) also saw the role of nutrition educators to be one of empowering clients: "The object of empowerment is not simply to convey new bits of information or to induce specific behaviours. It is to support people in making their own analyses so that they themselves can decide what is good for them" (p. 193). These same thoughts are mirrored in the goal-setting model. Shortridge proposed that establishing value-consistent goals for behavioural change and consciously taking action to implement the goals led to greater self-efficacy and a more positive self-esteem (Shortridge, 1985).

The Dairy Council of California (DCC) has used this model to develop a number of their programs. Recently (1991) they conducted their own evaluation of a booklet designed for pregnant women - *Pregnancy - A Special Time for Nutrition and Good Health* (DCC, 1993). The purpose of the evaluation was to identify the demographic characteristics of the user group, and gauge the effect of the resource on attitudes and behaviour of the user group.

Eleven hundred and seventy surveys were distributed to women in California, but the return rate was only 5%. The key messages of this resource were:

- Pregnant women should get their calcium from the milk group rather than pills;
- To control weight gain, pregnant women should cut back on extras;
- Pregnant women should choose a balanced diet.

Eighty-two percent of those women who responded positively to the statement that calcium needs could be met from milk products, and 60 percent stated that they increased their consumption of products from that food group. Sixty-five percent stated that the process outlined in the booklet helped them to make dietary changes.

Similarly, a resource was designed for parents -A Guide for Busy Parents: Feeding Your Young Child (1993). This educational resource was intended to provide parents with strategies for ensuring that their children received adequate nutrition at meals and snacks. While other resources have relied on a 24-hour food record to evaluate food choices, this was different in that it asked parents to estimate the foods their children consumed over time. This method is referred to as a food frequency. When these foods were checked off, the parents were then asked to identify a new food they might plan to serve to their child, and then devise a plan to incorporate it into their meal plan. Hence the goal-setting model is once again used to implement changes in food choices.

This resource was also evaluated (1993) but with a very small number of clients (N=18). The study participants found the resource to be generally helpful, but in particular the Food Chart where they recorded the foods their child ate was the most helpful. Two-thirds (67%) said they would use the chart to plan their shopping list, and some felt that it emphasized what they needed to do.

The two evaluations just mentioned must be regarded with a measure of caution. The evaluations were conducted internally by the DCC and hence cannot be recognized as entirely free of bias. However, other programs that have been developed by DCC for students have been recognized in the field of nutrition as being successful. Secrets of

Success (SOS) is recognized by Contento et al. (1995) as being one of the published studies based on theory and which identified successful outcomes. SOS is a program aimed at fifth graders. It, like others recognized in this research, is based on goal setting. Students maintained 3-day food records, then were taught over a 10 week period how to analyze it according to the food guide, and how to take responsibility for improving their food choices by developing a written and specific plan to make change. Tracking the progress of students in California, Oregon and British Columbia, the authors assessed food intake for all four food groups in a pretest, posttest, and at 6-8 weeks following instruction. Intake of all four food groups increased from the pretest to the posttest, and again at the 6-8 week mark after instruction (see Table 1) (Howison, Niedermyer, & Shortridge, 1988).

In another study in which goal setting was a component of the program, White and Skinner (1988) introduced a nutrition education program to adolescents in the Knoxville, Tennessee area. However, unlike the previously mentioned study, the authors focused on nutrients rather than food groups as the object to improve. They contend that a nutrient-based approach is preferable for adolescents who have become desensitized to the four food groups. They reported that goal setting was effective in getting students to improve their intake of calcium, vitamin A, and C, but goals related to iron and folic acid were less effective. However, the authors found that ,overall, 67% of the sample reported improved intake of the nutrient they selected to improve, hence proving that goal setting has a significant positive effect on behavioural change.

Table 1

Mean Number of Servings From Food Groups as Reported by Students

Food Groups												
Food	Milk Prod.			Meats			Veg. and Fruit			Grain Products		
	CA	OR	BC	CA	OR	BC	CA	OR	BC	CA	OR	BC
Recall												
Pre	1.7	1.7	1.5	1.5	1.6	1.4	2.0	2.1	2.7	2.6	2.5	3.2
Post	2.5	2.8	2.9	2.4	2.2	2.4	3.4	3.7	3.8	3.8	3.8	4.4
6-8	4.3	3.6	3.3	2.3	3.5	2.1	4.3	4.0	4.3	4.4	4.3	4.0
Weeks												
Post												

Adopted from Howison, Niedermeyer, and Shortridge, 1988

The literature on the effectiveness of goal setting as a component of nutrition education is limited. The fact that nutritionists have only come to regard themselves as educators in the last decade or so may account for the sparseness of material in this field. Nevertheless, there is a strong sense both at Dairy Farmers of Ontario, and in the profession of nutrition education that goal setting is an effective strategy for behavioural change. Hence, this research will be valuable in providing further evidence that this is true. Based on this literature search, it is hypothesized that those participants who are taught using a goal-setting approach will be more likely to make behavioural changes in their eating patterns, and that they will be able to maintain these changes for a longer period of time.

Summary of Literature Review

In summary, the field of adult education is diverse, but nevertheless, has become a sophisticated area of study. Its roots lie in the work of Dewey (1933, 1938) who sought to change the established view of learners as mere vessels to be filled with knowledge. Rather, he proposed that learners be allowed to learn through experience. He also proposed that critical reflection be the goal of education. Few would argue against that today.

The assumption that adults are self-directed was first proposed by Knowles (1980). While this principle was debated for years, it has come to be regarded as an endpoint that adult educators should aspire to. That is, if an adult is not already self-directed, then the adult educator should, through a collaborative model that includes support and direction, assist the learner to become so.

Mezirow (1991) suggested that transformative learning is the actual goal of adult educators. In his model of education, adults are encouraged to question in a reflective manner, not only the content or process of new knowledge, but the premises that underlie it. Premise reflection is the highest order of reflection and may lead to adults making radical changes in their lives. Mezirow saw the role of the adult educator as being one of support and encouragement towards new ways of thinking, and suggests that this be done in an environment of equality.

Educators must also take into account the fact that learners prefer to acquire information in different ways. Adults' learning styles and personality types will influence how well they approach a learning situation which requires them to work independently. To determine the styles and types of the participants in this research, this paper has reviewed The PET Type Check as well as Kolb's Learning Style Inventory.

The goal-setting model developed by Shortridge (1985) assumed first of all that adults are self-directed and prefer to make decisions themselves rather than have them imposed by another. In this model, Shortridge contended that people will make behavioural change when the outcome of that behaviour makes them feel good about themselves, and when they feel confident of being able to accomplish the change. In other words he used the constructs of self-efficacy and outcome expectancy central to Bandura's (1977) Social Learning Theory. Decision-making regarding change and selection of appropriate strategies to make change stresses the need for participants to critically reflect on their experiences. At the same time, the emphasis on personal

responsibility for goal selection and implementation should lead to a greater sense of responsibility on the part of the client.

As will be shown, the process of analyzing food choices and comparing them to recommendations may result in transformational learning. It may be a transformation of knowledge or a transformation of process, but a change in values regarding for example health, body weight, or body image would be learning of the highest order. The goal-setting model was developed on the assumption that values would be examined and might undergo change as people seek out behaviours which enhance their self-concept. Hence transformational learning is anticipated as people use the goal-setting model to make behavioural change.

The connections between the concepts examined in this literature review and the goal setting model used in this research will be demonstrated. The focus of this research is to verify whether this model is as effective as implied.

CHAPTER THREE: METHODOLOGY AND PROCEDURES

Overview

This study was designed to evaluate the effectiveness of the goal-setting model in behaviour change. It was conducted at Chedoke-McMaster Hospitals in Hamilton within the context of an existing weight loss program. The program has been in existence for more than 12 years, and is taught by dietitians. Clients pay \$190 to attend the program, and receive a rebate of \$2.50 per class that they attend (\$25 rebate if they attend all the classes).

Classes were assigned at the beginning of the program to be either part of the control group or part of the experimentals. The control group was taught the program in the conventional way which includes lecture-style classes as well as a prescribed diet. This diet outlined exactly what types of food and how much the client should consume daily. In contrast, the experimentals were not given a weight-reducing diet but were instructed on Canada's Food Guide to Healthy Eating. They were provided with goal-setting sheets and were asked to use them to help focus on making changes to their diet.

All participants were asked to fill in a pretest questionnaire on the first night of classes as well as an information sheet outlining demographic information. During the 10-week course they were also asked to fill in the question sheets for the PET Type Check as well as Kolb's Learning Style Inventory. At the last class they completed a posttest questionnaire, and the experimental group completed a call-back questionnaire 6 months after the program was finished. As was mentioned in the Limitations, the number of participants in the program was much smaller than had been anticipated. Hence the total number of participants in the study was 39 instead of the 60 expected. Therefore

qualitative research was added to the study. Five of the experimental group were contacted and taped interviews were conducted that were approximately 1 hour in length.

Description of Research Methodology

Design

A correlational design was used in this study. Variables include data collected in the pretest survey, posttest survey, and in the case of the experimentals, the call-back survey. As well, data were collected on the participants' responses to the PET Type Check and the Kolb's Learning Style Inventory. The classes were already organized by virtue of signing up for the weight loss program, Less-On Lifestyles, and each class was assigned to act as part of the control group or the experimental group.

A qualitative component was added to the research when it was evident that there would not be as many participants in the study as was anticipated. Of the group of experimentals, five were interviewed either at their home or at the home of the investigator. The interviews took approximately an hour and were taped. All participants were informed that they would be on tape and were told they could shut it off at any time if they felt uncomfortable.

Sample

The sample consisted of 39 clients who had signed up to be part of the weight loss program conducted at Chedoke-McMaster Hospitals in Hamilton. The research took place from January, 1995 to March, 1996. Weight loss is usually an issue of greater importance to women than to men, and that was apparent in this study where women

comprised 95% (N=37) and the men 5%(N=2) of the total sample. Participants ranged in age from 23 to 73 years.

Two people in the experimental group could not be contacted for the call-back questionnaire, despite several calls being made at various times of the day. As well, one of the experimental group did not fill out the posttest, although she was available for the call-back.

Education level ranged from elementary school to university level with most participants being college-educated. Seventy-seven percent of the participants reported that they were employed, while 23% said they were unemployed. Fully 92% of the respondents had attended a weight loss program in the past, while for eight percent, attendance at Less-On Lifestyles was their first experience in a weight loss program.

Instrumentation

The instruments included in this study were: 1) Demographic questionnaire; 2) The pretest questionnaire; 3) The posttest questionnaire; 4) PET Type Check; 5) Kolb's Learning Style Inventory; 6) Call-back questionnaire; and 7) Interviews.

Questionnaires

At the onset of the program, the participants were asked to provide some demographic information regarding age, gender, level of schooling, description of current job, marital status, number of dependents, and whether or not they had attended a weight loss program in the past. In the pretest questionnaire they were asked about whether they had set a goal at the onset of the program, their familiarity with the Food Guide, and to

identify the food groups that comprised the Guide, and finally the number of servings they consumed from each of the food groups.

In the posttest they were again asked whether they had set a goal and to define it. Several more questions were designed to clarify their goals for behaviours related to food as well as physical activity. They were asked again to list the number of foods they consumed from the four food groups, and to identify the most important information that they had learned regarding food and physical activity. Questions on the call-back survey were much the same as the posttest. The questions on demographics, as well as all three surveys are included in Appendices A through D.

To establish content validity, the questionnaires were reviewed independently by nutritionists on staff at Dairy farmers of Ontario. Much of the job of the nutritionist is comprised of program evaluation, and therefore all staff members have had experience developing questionnaires. In addition, the firm, Commins, Wingrove, a research company that works for the DFO was asked to review the survey. The employees of that company are members of The Professional Marketing Research Society of Canada.

Kolb's Learning Style Inventory

The (1985) version of Kolb's Learning Style Inventory (LSI) used in this study was designed for research purposes. It is a self-ranking tool which assesses the user's preferred learning style by having them respond to 12 simple questions related to how they prefer to learn. An earlier version (1979) of this tool had received criticism for its poor measurement properties. Some of the criticisms levied include: the scoring method guarantees that some scales must be negatively correlated; the two dimensions of the LSI

account for only 21% of total variance between scores; and test-retest results indicated that the LSI was volatile (Freedman & Stumpf, 1978). In an effort to address these issues, Kolb revised the LSI (1985).

Sims tested this revised version with 619 students and found it much improved (Sims, 1986). Internal consistency of the LSI 11 scales were much higher, however, test-retest reliability was still found to be poor. Sims felt these results might be sample-dependent since the subjects were young and might be in the process of developing a learning style. But he also felt that the form of the questionnaire itself might produce high internal consistency as a result of a particular response set. That is, the available responses to questions were arranged in the same manner for each question, so that the first response dealt with feelings, the second with watching and listening, the third with thinking and logic, and the last with being active and getting things done.

This lack of reliability was addressed in an even more-recent version. To address the test-retest issue and the question of internal consistency, the newest version has scrambled the sentence endings. Kolb claims that this latest revision has resulted in a tool with high test-retest reliability (1994). The LSI can be found in Appendix E.

PET Type Check

The PET Type Check was developed over a period of five years and with over 2,000 individuals to establish reliability. A pilot test followed by two test versions were used to fine-tune the instrument and to establish reliability and validity. Reliability of the 80 responses used in the instrument (10 for each type) was determined by Cronsbach's Alpha. Content and face validity were also noted to be acceptable. Interim correlation

were estimated within scales and across scales to establish both consistency and discriminant validity. A copy of the PET Type Check can be found in Appendix F.

Interviews

In order to better understand the nature of the learning which took place in Less-On Lifestyles, in-depth interviews were conducted with five of the participants who had experienced the goal-setting model. Three of the interviews took place in the homes of the subjects at a time that was convenient to them. The remaining two took place in the home of the researcher.

Interviewing is used as a means of obtaining information on behaviours and feelings or to understand how people interpret the world around them (Merriam, 1988). In other words, we interview participants to access their perspective on an experience. There are varying levels of structure to interviews. Patton (1987) described the approaches as: 1) the informal conversational interview; 2) the general interview guide; and 3) the standardized open-ended interview. Merriam described them as being on a continuum from the highly structured interview which is basically an oral form of a written survey; to the semistructured interview where certain information is desired from all the respondents and which are guided by a list of questions; to an unstructured interview where the researcher does not know enough about a subject to ask relevant questions (1988). For the purpose of this research, the format chosen was that of the general interview guide or semi-structured interview.

“The fundamental principle of qualitative interviewing is to provide a framework within which respondents can express their own understandings in their own terms”

(Patton, 1987 p. 115).

Questions are asked to elicit information of six different kinds. These are:

1. Experience or behaviour questions which are aimed at eliciting information about activities or behaviours which would have been observed had the observer been present.
2. Opinion/value questions which are asked to find out what people think about a program.
3. Feeling questions that are aimed to understand the emotional response to an experience.
4. Knowledge questions which tell the researcher what factual information the respondent took away.
5. Sensory questions which determine what sensory stimuli the respondents may be sensitive to.
6. Background information which provided demographic information (Patton, 1987).

Demographic information was provided during the pretest questionnaire, and therefore was not needed here. As well, the sensory questions seemed to be less relevant to this interview, and therefore were not posed. However, the first four questions were important to understanding the participants' experience, and hence formed the basis for these interviews. The questions can be viewed in Appendix G.

Procedures

The clients would have heard about Less-On Lifestyles through an advertisement in the local newspaper, through community service messages, or possibly through their family doctor or an allied professional who was familiar with the program. They joined Less-On and agreed to attend the 10-week program at a cost of \$190.00.

On the first night of classes, an assessment of weight, height, and age was done by the registered dietitian who then used the information to calculate energy requirements based on the Harris Benedict Equation. The control group would have been provided with a diet plan outlining the total calories and number of servings to be consumed from proteins, starches, fruits and vegetables, milk products and extras. These food groups correspond to the food groups identified in Canada's Food Guide to Healthy Eating. The client would be expected to restrict food intake to that level for the duration of the program, and the restriction is estimated to allow for a 1 kg (or 1-2 lb.) weight loss per week over the course of the program.

For the purpose of this study, the experimental group were not provided with a diet sheet, but instead was instructed on Canada's Food Guide to Healthy Eating. They were given a copy of the guide, and were asked to keep track of their food intake over the next week. Once they kept track of their food intake, they were asked to compare what they ate to the recommendations of the food guide. If they were not consuming enough of a food group then their goal would be to increase their intake of foods from that food group. This is the first priority of the goal-setting process.

The second priority is variety. If a participant was choosing adequate servings from each food group, but was not choosing a variety of foods from a food group, then the goal should be to improve variety.

The third priority is to limit intake of Other Foods, and the participants were expected to decrease their intake of these if they were meeting their energy needs by choosing too many of these foods. While the food guide provides guidelines for minimum and maximum number of servings within the four food groups, they do not quantify the number of Other Foods that should be chosen. The recommendation is to consume Other Foods that are high in fat and calories in moderation. Hence it is left up to the individual to determine how much that is.

The 10 week program included a weekly weigh-in, and a lecture-style class in which various nutrition topics were covered, including exercise, shopping, calcium, fiber, restaurant eating, and others. As these topics were discussed, the participants were encouraged to use goal-setting sheets to make dietary changes, such as increasing their intake of calcium or fiber, and decreasing their intake of fat. The goal-setting sheets were designed to help them through the process of setting a goal and evaluating their success at implementing goals. A copy of the goal-setting sheet can be found in Appendix H.

Halfway through the 10 week program, the participants were asked to fill out the PET Type Check and Kolb's Learning Style Inventory. At the last class they filled out the posttest questionnaire. That was the last time the control group was contacted, however, the experimental group was contacted by phone 6 months after they finished the program to answer the call-back questionnaire. When all of the questionnaires had been completed,

it was decided to include the interviews, and the subjects in the experimental group were contacted to set up interview times.

Data Analysis

Data collected from this study were analyzed using t-tests to compare variables in the questionnaires across experimental and control groups as well as across pretest, posttest, and call-back testing. When the data were categorical (nominal) in nature, chi squares were used to make this comparison. The results obtained are presented in tables, with means and standard deviation provided. From the literature it has been suggested that goal setting is an important strategy to assist people in making changes to their eating habits. Yet few studies have been conducted to test that. Therefore, this study was designed to test the hypothesis that goal-setting will improve an individual's ability to institute long-term change in eating behaviours.

Limitations

As with any study, this one has its limitations. The first concern is the selection of subjects. Ideally, subjects should be assigned randomly to receive the treatment. However, given the design of this research, it was more realistic to treat all the clients in a class as the treatment group, while all those in another class were treated as the controls. Because the participants were informed about the research, it could influence what they did in the course of the study. This is known as subject effects.

The number of participants who were able to participate were far fewer than had been expected, as was pointed out earlier. Initially it was expected that at least 60 participants would join Less-On over the course of the study period. Unfortunately, that

was not the case. The lack of participants may be related to the financial cutbacks that so many are experiencing during these economic times. There is little that can be done about that. Therefore the results of this study cannot be extrapolated to reflect the population at large. Weight issues are, generally speaking, a women's issue and therefore there are more women than men who attend these types of programs. Hence, the results found in this study cannot be assumed to be generalizable to men.

The instructor might have treated subjects of one group differently than those from the other because she was using a different teaching method with them. This is referred to as experimenter effects, and can influence internal validity.

Much of the data collection was based on responses to questionnaires. This method of evaluation assumes that people are honest and are able to answer the questions accurately. Some people may find it more difficult to express themselves in a written format than they would in responding orally. Conversely, participants involved in interviews might have been more inclined to give the answer they thought the interviewer was looking for rather than what is correct. Therefore, self-reporting is recognized as a limitation of this study.

There also may have been some limitations with the design of the interviews. First of all, it must be noted that the number of interviews was not large. Only 5 interviews were conducted, but if time had permitted, it would have been preferable to do several more - perhaps as many as five. As well, in interview sessions, those being interrogated generally are anxious to please the interviewer. Since the interviewer was the researcher, desired answers may have been apparent, or the researcher may have inadvertently led the

participants in questioning. Hence, it might have improved study design to include a third party to conduct the interviews.

Other limitations of the study include the fact that the interview questions were not pretested due to time constraints. To do so might have led to insights into how the questions could have been improved. Although it is felt that they are adequate, the lack of the pretest step leaves only surmise rather than proof. Finally, the interviews were conducted in the homes of the participants or in the researcher's home which may have introduced a bias.

CHAPTER FOUR: FINDINGS

The purpose of this study was to assess the effectiveness of the goal-setting model in behavioural change. Answers of the control and experimental group were compared on the pre- and posttests. As well, the experimentals were compared between pretest, posttest, and call-back. Reported behavioural change was compared across psychological type and style preferences. Descriptive and inferential statistics are presented in this chapter.

Descriptive Statistics

Table 2 provides a summary of the demographic information collected. As was indicated earlier, the range of ages was between 23 and 73, with the mean age of participants being 47.6 years. The number of women in this study reflect the preoccupation that this gender has with weight and represents 94.9% of the total sample (or 37 participants), while men represent 5.1% (or 2 participants). The level of education completed by participants were as follows: grade school (5.1%) high school (23.1%), college (28.2%), and university (43.6%). Seventy-six percent of the participants reported being employed, with 23.1% reporting being unemployed. Although it wasn't asked, it is probably safe to assume that some of those were retired, since they are of a chronological age to be so. The types of work reported ranged from assembly worker to judge, with 15.3% (N=6) of the participants reporting that they worked as nurses, and another 15.3% (N=6) reporting they worked as teachers. With regard to marital status, five participants (12.8%) were single, 28 (71.7%) were married, four (10.2%) were separated or divorced, and two (5.1%) were widowed. Participants who had children numbered 21 (53.8%), while 17 (43.5%) said they had no dependents. One did not answer the question.

The number of dependents were as follows: 1 (28.2%), 2 (7.7%), 3 (15.3%), and 4 (2.5%). When asked if they had attended a weight loss program in the past, 36 participants (92.3%) admitted they had, while 3 (7.6%) said they had not.

On the pretest, participants were asked whether they had a goal as they entered Less-On Lifestyles. Thirty eight, or 97.4% of the participants said they did and one (or 2.6%) said they did not. When asked to describe their goal, many described more than one. Thirty-three of the sample, (84.6%) identified weight loss as one of their goals; learning to eat properly was cited by 15 people (38.4%); improve physical activity was cited by six people (15.3%); two participants (5.2%) hoped to improve a medical condition.

When asked if they had heard of Canada's Food Guide to Healthy Eating, 38 (97.4%) admitted that they had, but only 16 (or 41%) had a copy of it, 21 (or 53.8%) did not, and 2 (or 5.3%) did not answer. The food guide had influenced 38.5% to make changes in their eating habits in the last two years, but 59% or 23 participants were unaffected by the recommendations of the food guide, and one person did not answer the question.

However, being aware of the food guide and understanding it are different things. When asked to identify the number of food groups 23 (or 59%) were able to identify four food groups, 12 (or 30.8%) identified five food groups, and one (or 2.6%) suggested there were seven food groups. No response was provided by three participants or 7.7% of the sample. Participants were asked to identify, from a list the food groups, which ones

were part of the food guide. Table 3 provides a summary of the responses to this question.

The majority of participants were able to identify the correct answers to the food groups for most of the food groups (meat, grain products, and vegetables and fruit), but with milk products, the answer most commonly given was dairy products as opposed to the correct name, milk products. However, the terms are used interchangeably in common language and hence confusion is not surprising.

The last question asked in the pretest survey was about the number of servings of foods consumed on a daily basis. This question was also asked in the posttest and on the call-back. Table 4 summarizes the responses to this question in all three surveys.

In the posttest, participants were asked to describe the food goal they set for the program. At the call-back, the experimental group was asked if they were still following a goal, and to describe it. The answers to these questions are summarized in Table 5.

Table 2

Demographic Data

Variable	Frequencies of Responses			
Gender	Males	Females		
	2 (5.1%)	37 (94.9%)		
Education	Grade School	High School	College	University
	2 (5.1%)	9 (23.1%)	11 (28.2%)	17 (43.6%)
Employed	Yes	No		
	30 (76.9%)	9 (23.1%)		
Marital Status	Single	Married	Divorced/ Separated	Widowed
	5 (12.8%)	28 (71.8%)	4 (10.3%)	2 (5.1%)
Dependents	Yes	No		
	21 (53.8%)	17 (43.6%)		
Number of dependents	1	2	3	4
	11 (28.2%)	3 (7.7%)	6 (15.4%)	1 (2.6%)
Attended a weight loss program before	Yes	No		
	36 (92.3%)	3 (7.7%)		

Table 3

Food Groups in Canada's Food Guide to Healthy Eating

Food Group	Number of Responses	% of Sample
* Meat	35	89.7
Carbohydrates	19	48.7
* Fruit/Vegetables	35	89.7
* Milk Products	27	69.2
* Grain Products	35	89.7
Dairy Products	32	82.1
Fats	11	28.2
Sugars	7	17.9
Pasta	17	43.6
Fibre	17	43.6

* Correct Answers

Table 4

Number of Servings Consumed from the Food Groups (%)

	Pretest		Posttest		Call Back
	Controls	Experimentals	Controls	Experimentals	
Grain Products	3.5	4.1	4.4	4.2	4.1
Vegetable/Fruit	3.5	3.0	5.1	4.2	4.1
Milk Products	1.6	2.6	2.3	2.3	2.2
Meats/Alts	2.4	2.9	3.1	2.4	2.0
Other Foods	4.7	4.7	2.1	1.95	2.4

Table 5

Description of Food Goals By Group

Description of Food Goals (Posttest/ Call Back)	Controls N=17		Experimentals N=22		Experimentals N=20	
	Posttest		Posttest		Call Back	
	N	%	N	%	N	%
To Lose Weight	8	47	4	18	3	15
Eat Nutritiously	8	47	7	31.8	3	15
Decrease Fat/ Sugar	6	35.2	6	27.2	8	40
Increase Vegetables & Fruit	1	5.8	5	22.7	3	15
Decrease Portion Size	3	17.6	1	4.5	0	0
Increase Variety of Foods	1	5.8	0	0	0	0
Decrease Snack Foods	1	5.8	0	0	0	0
Increase Fiber	0	0	3	13.6	1	5
Decrease Meats and Alternatives	0	0	1	4.5	1	5
Increase Milk Products	0	0	1	4.5	2	10
Follow Canada's Food Guide	0	0	0	0	4	20
No goal	0	0	0	0	3	15
Decrease Muscle Mass/ Exercise	0	0	4	18	1	5

In the posttest, participants were asked whether they had set a goal for physical activity. This information is summarized in Table 6. The first question was related to what type of goal they set (i.e., a goal to add more activity to their day or a goal to do an activity for a longer time). Twelve of the controls said their goal was to add more activity to their day, and one was planning to do activity for a longer period. Amongst the experimentals, two were planning to do an activity for a longer time, and 20 were planning to add more activity to their day. Of the controls, five identified walking as their means of increasing activity, while three were planning to go to the gym, one to work- out aerobically, and one to workout on the treadmill. The rest (five) did not specify the type of exercise they intended to do. On the other hand, 12 experimentals planned to walk, one to add aerobic exercise and weight-bearing exercise to the day, one to go to the gym, and one to start a cross-country work out [sic]. In this group, three did not specify the activity they intended to do.

In response to a question on the most important thing they learned about healthy eating, the answers were quite varied. A summary of the results is provided in Table 7. A similar question was asked related to physical activity, and the responses to that question are summarized in Table 8.

Table 6

Types of Activity Goals Set

	Controls		Experimentals	
	N=17		N=22	
Which of the following best describes your physical activity goal	N	%	N	%
To add more activity to your day	12	76	20	90.9
To do an activity for a longer time	1	5.9	2	9.1
What was your goal?				
Walking	5	29.4	12	54.5
Gym	3	17.6	1	4.5
Aerobic Workout (and Weight-Bearing Exercise	1	5.8	1	4.5
Treadmill	1	5.8	0	0
Cross Country Workout	0	0	1	4.5
No Goal Specified				

Table 7

The Most Important Thing About Healthy Eating

Thing Learned About Healthy Eating	Controls		Experimentals		Experimentals	
	N=17		(Posttest)		Call-Back	
			N=21		N=20	
	N	%	N	%	N	%
Eat right to feel better	2	12	0	0	0	0
Fat content of food	9	53	10	48	12	60
How to eat properly	2	12	6	28.5	6	30
Fiber content of food	2	12	3	14	2	10
Set reasonable goals	2	12	2	9.5	0	0
Read labels	3	18	1	4.7	1	5
Portion Control	1	6	0	0	1	5
Sugar/ sugar substitutes	1	6	2	6	0	0
Moderation/ Balance/Variety	3	18	2	6	0	0
Caffeine content of food	1	6	0	0	0	0
Breakfast is important	0		1	5	1	5
Decrease meat and alts.	0	0	1	5	1	5
Calcium content of food	0	0	0	0	1	5
Cholesterol from animals	0	0	0		1	5

Table 8

Most Important Thing About Physical Activity

Thing Learned about Physical Activity	Control		Experimentals	
	N	%	N	%
Physical Activity important for weight loss	10	58.8	13	59
Have to use up energy from food	3	17.6	0	0
Important for disease prevention (osteoporosis, heart disease, blood pressure)	2	11.7	7	31.8
I don't like to exercise	1	5.8	0	0
I need to do more	3	17.6	0	0
Importance of muscle mass	0	0	3	3.6
I feel better	0	0	1	4.54
Every little bit counts	0	0	3	13.6

Chi-squares were performed to determine whether responses to the questionnaire items varied across any of the demographic variables. Some interesting information was gleaned. Thirty five responded to the question regarding success at meeting their goal. Ninety two percent of the successful were employed, while eight percent who reported being successful were not. Five of those who were employed were unsuccessful at meeting their goal, Two who were not employed reported meeting their goal and five who were not employed also did not meet their goal. It seems that being employed helps people to be more successful at goal setting, however it may be difficult to consider this a very sound statistic given the limited number of participants.

Success at meeting the goal also varied across levels of education. Here it appears that the higher the level of education, the greater the likelihood of being successful in goal setting. Similarly, marital status seemed to influence the chances of setting a goal for physical activity. Here, 33 participants reported setting an activity goal, while five did not. Of those who did set a goal, 78.8 percent were married.

Finally, some other cross-tabulations with demographic data of note include a higher intake of meat and other foods amongst those with fewer dependents. Conversely, those with children are more likely to consume vegetables and fruit as well as milk products.

Hypothesis Testing

Participants in a weight loss program were taught to manage their food intake either by using a standard diet instruction or a goal-setting model. It was predicted that those who had received instruction with the goal-setting model would be more likely to make changes to eating habits and that these changes would persist over time.

To compare the two groups, answers to the pretest, posttest, and call-back surveys were compared using two-tailed t-tests. No significant differences could be established between the pretest and the posttest responses of the two groups. Nor was any difference established in the call-back surveys. Hence, the findings of this quantitative research does not support the hypothesis. However, as will be seen later, the qualitative research was more supportive of the hypothesis: that those who received the goal-setting approach were more likely to sustain a change in eating habits.

Comparative Statistics

Independent t- tests were calculated to identify differences between the means of the pretest and the posttest based on consumption of food groups as well as whether they will use the goal-setting model in the future. No differences were found on any of the items measured. Table 9 describes the items in the surveys that were compared between the two groups, and provides the means and standard deviations for those items.

Several questions in the surveys asked participants to describe the goal they had set by choosing a statement which was closest to that goal. Those data were analyzed using chi squares. No significant difference was found between the two groups in analyzing the data. The groups were likely to set a similar goal, were both likely to set a

new goal at the end of a program, and were similar in their likelihood to meet that new goal.

When the groups were asked if they had set a goal for physical activity, the experimental group were more likely to say that they had. The level of significance ($<.08$) while not significant, might have been greater had there been a larger sample size.

Table 9

Comparative Data of Pretest and Posttest

Item	Number	Mean	SD
<hr/>			
Will you use the goal-setting model again?			
Controls	14	1.5	.68
Experimentals	21	1.5	.76
p	ns		
Consumption of Grain Products			
Controls	17	4.4	1.5
Experimental	21	4.2	2.1
p	ns		
Consumption of Vegetables & Fruit			
Controls	17	4.4	1.50
Experimentals	21	4.2	1.50
p	ns		

table continues

Consumption of Milk Products			
Controls	17	2.2	1.21
Experimentals	21	2.2	1.05
p	ns		

Item	Number	Mean	SD
Consumption of Meat & Alternatives			
Controls	17	2.5	1.07
Experimentals	21	3.1	1.79
p	ns		
Consumption of Other Foods			
Controls	12	2.9	1.57
Experimentals	14	2.7	1.50
p	ns		

Paired samples t-tests were performed to compare consumption of food groups between the experimentals in the pretest and call-back. No difference was seen for consumption of grain products or milk products, however significant differences were noted in consumption of vegetables and fruit, meat and alternatives, and other foods. Vegetable and fruit intake went up significantly from the pretest to the call-back ($p < .0001$); meat and alternatives consumption declined in the same period ($p < .05$); and consumption of other foods declined ($p < .005$). The means, standard deviations, and levels of significance are presented in Table 10.

With respect to personality type and learning style, no correlation could be established between these factors and any of the variables measured in this study, likely due to the low numbers in the study.

Interviews

While the quantitative investigations in this study proved to be disappointing, the results of the qualitative research provided more positive support for the idea that goal setting can help to effectively change eating behaviours.

Five interviews were conducted, three in the homes of the participants, and two in the home of the investigator. These interviews took place almost eight months after the participants had finished the Less-On Lifestyles program. The interviews were of a semi-structured design, and as was mentioned earlier, the interview guide can be found in Appendix G. While attention was paid to the questions, participants were allowed to explore the topic at their own pace. Such a format allowed for greater insights into their experience.

Table 10

Paired T-tests for Consumption of Food Groups by Experimentals in all
Questionnaires

Item	Mean	SD	p
Grain			
Products			
Pretest	4.2	2.38	ns
Call Back	4.1	1.71	
Vegetables			
& Fruit			
Pretest	2.9	1.74	.0001
Call Back	4.1	1.38	
Milk			
Products			
Pretest	2.7	2.23	ns
Call Back	2.2	1.14	
Meat &			
Alternatives			
Pretest	3.0	1.95	.027
Call Back	2.0	0.91	

table

continues

Other

Foods

Pretest	5.7.	3.43	.002
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Call Back	2.5	0.80	
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Initially, there was a concern that the participants might not be able to separate out the goal-setting model as different from their experience of the weight loss program, Less-On Lifestyles. However, that proved not to be the case. All of the interviewees were clear about what the goal-setting model was, and how they were able to use it to make behavioural change. All of them began by identifying changes they had made. These changes included increasing consumption of vegetables and fruit, choosing more whole grain products, decreasing fat, trying to eat breakfast, and increasing activity level.

When they were asked how they managed to remain successful, one person (C. M.) said that he wrote the goal into his computer as a personal reminder. It became a task that he had to complete over the course of the day. Another (J. D.) said that she simply retained it as a mental reminder to eat five servings of vegetables and fruit per day, and by making that a daily goal that she could be successful. C. B. said she was able to add activity into her life by aiming for a small goal at the onset. Initially she wasn't able to walk for 15 minutes, but by gradually increasing that time she was able to increase activity to an hour. As well, she dealt with barriers as they arose. She put on layers of clothing so that she could remove a layer if she got too hot. She would also stop and get a drink halfway through which gave her a rest and helped her to rehydrate. Another (L. S.) indicated that she became increasingly motivated to follow low fat recommendations when her husband's health was threatened by heart disease. R. S. took a gradual approach to the problem which included a number of strategies to decrease fat. She threw away her deep-fat fryer, cut back on consumption of butter in meal preparation, and generally became more aware of the sources of fat in her diet.

None of the participants found the changes exceptionally difficult to maintain. All quite clearly recognized these as lifestyle changes. Where almost the entire study group entered Less-On Lifestyles with the goal to lose weight, those in the experimental group were more likely to switch their goal to one of making lifestyle changes. Certainly that was true of those interviewed here. They all had experienced some weight loss during or since the program, and all expressed a desire to lose more weight. However, they appeared to be more focused on doing it through changes in eating behaviours.

The attitude of these participants towards the goal-setting process was for the most part, very positive. They said that they found it helpful and rewarding to approach the problem in small ways. "Making more modest change is more attainable, therefore you have a small triumph. You're looking for triumphs. Triumphs make you feel good" (C. M.).

Similar positive feelings were echoed by others. R. S. stated that the goal-setting model made her feel good about herself. "I feel good about taking care of myself." C. B. finds a new goal difficult to implement initially and recognizes that it can make her "miserable" but if she persists, she feels good about it. L. S. finds the goal-setting process "very helpful" and states that she too, feels good about herself when she makes changes.

One subject, J. D. was reluctant to admit that the goal-setting model was helpful for her. She is a teacher and says that she uses goal-setting with her students all the time. It was not new to her. However, she identified several changes that she had implemented since the program to reduce her fat intake, and to consume more vegetables and fruit.

When it was pointed out to her that she had in fact set goals and was using strategies to meet them, she agreed that indeed she was using the goal-setting model. Her case is somewhat less convincing than the others since she was using the model in a more-or-less unconscious way. However, when asked if she thought she would have applied the goal-setting model without having learned it through Less-On, she felt it was unlikely.

One issue that was not intentionally asked about and yet came through in the interviews was self-efficacy. As was discussed in the literature review, the goal-setting model can improve self-efficacy. As a person experiences success at making changes, they will have increased confidence in their ability to make other changes. Certainly, that was found to be true amongst the subjects of this qualitative research. Four of the subjects clearly identified the goal-setting model as increasing their confidence in themselves. The types of statements made were:

“Making changes has increased my self-esteem. I feel more confident about myself now” (C. B.).

“The goal-setting process allowed me to meet success each week. It will help me to make changes in the future” (L. H.).

“I’ve made a lot of changes. I identified problems, put goals into action and felt so good. It has improved my self-esteem” (R. S.).

“It was hard at first, but I made the goal easy enough to be able to keep that goal. It became a re-enforcement for further change” (C. M.).

Participants were able to keep on track by recording their food intake (C. B. and L. H.) or by putting it on the computer (C. M.), while for others it was a matter of keeping a mental score (J. D.).

The interviewees were asked what was the most important thing they had learned about goal setting, and the responses were largely the same: Set realistic goals. Here are the verbatims received in response to this question.

“Be realistic, for example with fruits and vegetables goal-add 2 more servings per day” (L. H.).

“Don’t expect something too big. It won’t come. Make it short term. It will come more easily to you” (C. B.).

“Don’t do it all at once. Set a long term goal, then set small goals to get you there. Don’t stop everything at once. Choose small things that you won’t miss, so you don’t feel deprived” (R. S.).

“You make a goal that’s attainable, then you can win. You conquer, then you can move on to bigger challenges” (C. M.).

Clearly, for these participants, the idea of making change, gradually and slowly so as to successfully incorporate them into their lifestyle was the best route. They experienced increased competence at making change and increased self-efficacy at being successful in making other changes. Hence, this qualitative research gives support to the idea that goal setting is an effective way to make dietary changes that persist over time.

Summary

The quantitative results of this research do not support the hypothesis that goal setting is a more effective means of making behavioural change in eating habits than

prescription of a diet. No differences were seen between a control group who were taught the program using the conventional method of a prescribed diet, and an experimental group who were taught to change eating habits through a goal-setting model. Nor was this research able to confirm a correlation between learning style and psychological type and success with the goal-setting model. This is disappointing since the idea that a certain type or learning style might be predisposed towards working independently seems to be a natural fit. However, the qualitative component of the research was indeed quite supportive of the research. Five interviews with participants who experienced the goal-setting model provide strong support for the notion that teaching people skills to make changes on their own results in long-term behavioural change. The lack of evidence with the quantitative research is likely related to the low number of subjects in the study.

CHAPTER FIVE: SUMMARY, CONCLUSIONS, AND IMPLICATIONS

Conclusions

In conclusion then, there are several ideas to draw from this research. First of all it must be concluded that the quantitative research presented here does not support the hypothesis that goal setting is any more effective than a conventional method for making behavioural change. While disappointing, there may be some reasons for this outcome. First of all, as was mentioned initially, there were far fewer participants than were hoped for. It was expected that more than 60 people would enter Less-On Lifestyles over the study period. However, that was not the case. In total, we were only able to enroll 39 people for the study. While the reasons are not all that clear, it is thought to be related to the financial constraints experienced by many in today's economic climate. But the lack of participants may also be related to inadequate marketing of the program to the public. This limited number of participants may be the reason that so few differences were seen between the two populations. There were some comparisons that suggest that differences between the groups would have been more pronounced had there been larger numbers. For instance, when asked whether they had set a physical activity goal, a positive response from the experimentals was higher than the controls. While not statistically different at this level, it suggests a trend towards difference. However, it may well be that the goal-setting model makes no difference in how well people are able to make behavioural change.

The decision was made to include a qualitative component to this research when it was realized that the numbers would not be as great as expected. Doing so also dramatically changed the outcome of this research. It was found that responses made by

participants in person were much more elaborate, and much more positive than was gleaned from the surveys. The more positive responses provided in one-on-one interviews may well reflect several things. First of all, for many individuals responding orally rather than in written format might be easier. Hence what they disclose might more clearly reflect their feelings about the process.

As well, the lack of a clear difference between responses may reflect how the participants were feeling at the time of filling out the surveys. On the last night of classes, participants were asked to fill out the posttest. People are usually in a hurry to get out and that might have resulted in questions being answered hastily without much reflection on the answers. Conversely, when the interviews were conducted, the time was chosen by the individual, and they were anticipating the interview to take approximately an hour to complete. The situation was more relaxed, and the participants were given more time to reflect on their answers. Hence, these answers may more thoughtful and may more closely reflect the participants' experience.

The results of this study may also point to the fact that investigations of this nature require the in-depth study to get a true picture of people's experience. A questionnaire is more rigid than the type of interview conducted here. That rigidity may simply eliminate the possibility of candid comments seen in the qualitative research.

The goal-setting model developed by Shortridge (1985) contends that people will make changes when they feel confident about their ability to succeed at the change, and when the change makes them feel good about themselves. While Shortridge did not use the terms, he was actually talking about the constructs of self-efficacy and outcome

expectancy. The interviews conducted in this research very soundly support these premises. The participants clearly identified an increased self-confidence after implementing changes and experiencing success. From the responses elicited, it would seem that the participants felt better about themselves for having incorporated those changes into their lifestyle. All looked forward to continued efforts to change behaviours related to eating and activity, and identified the goal-setting model as the means to making those changes. It is also interesting to note that these interviews were conducted 8 months after the program had ended and still the participants were confident about their ability to continue with change.

The majority of the experimental group had changed their ideas about what was an important goal by the call-back. Weight was still an issue for three participants (15%), while 22 participants (or 85%) had as their focus some aspect of healthy eating. Goals included such statements as lowering fat intake, following Canada's Food Guide to Healthy Eating, increasing intake of vegetables and fruit, or milk products, or increasing fiber. It could be argued that this change in attitude about eating mirrors aspects of transformative learning.

Certainly in terms of their understanding of food and nutrition, content reflection occurred. Less-On Lifestyles aims to be a nutrition program, not just a weight loss program, and it was successful in increasing the participants' understanding of nutrition dramatically. But that is not an outcome of the goal-setting model. Strategies to change behaviour are, and the participants indicated that they had developed many strategies to meet their goals. For some it was finding ways to incorporate their goal into their daily

lives (e.g., recording the day's goal into a computer as a personal reminder); for others it meant learning to prepare foods differently (e.g. throwing away the deep-fat fryer, and using less butter in meal preparation); and for others, it was finding ways to deal with obstacles (e.g. using layers of clothing when walking so that they could be removed during the walk). Hence the model was successful in assisting these participants in process reflection.

However, it would also be reasonable to say that premise reflection, identified by Mezirow (1990) as the highest level of learning, took place amongst these participants. The rationale for this assertion is this: On entering the program, almost every participant stated that their most important goal was to lose weight. But even as much as 8 months after the program, some of those participants had revised their goal to be more focused on healthy eating. It may well be that the fact they learned so much about nutrition was at least to some degree responsible for the shift in values.

But it is equally possible that their change in attitude is a result of a change in self-concept. Rokeach, in his system of beliefs, stated that lasting behavioural change can only be successful when one has changed one's self-concept (Rokeach, 1972, 1979, in Sweeting, 1990). Once that has changed, values will shift, followed by attitudes, and lastly by behaviour. In this study, the experimental group would have made several changes throughout the program. Each successful change would have increased their self-efficacy at making changes to eating or activity choices. Hence by the end of the program, the experimental group were not so focused on weight loss (especially since they would not have experienced the level of success they were expecting at the onset) but rather on

the process of changing eating behaviours, since they would have been more successful on that front. Success would have positively influenced their self-concept (which was noted), and would ultimately result in the long term behavioural changes as seen here.

Implications

In summary, then, the qualitative component of this research study suggests that the goal-setting model is successful; however, the quantitative component failed to support the hypothesis that it is. Nevertheless, it seems that the Dairy Farmers of Ontario can feel confident that using this model in their programs does build the skills that people need to make behavioural change.

As well, Less-On Lifestyles may also feel confident that using this model in their program makes sense. The qualitative research appears to prove it to be a useful tool for participants in making long-term changes. Given that the goal of the program and of dietitians is to do just that, they should have little concern about adopting this route in the future instead of the more conventional diet plan.

Recommendations

Should any further research be done to evaluate this model it is recommended that the use of quantitative research be re-evaluated. The surveys completed here failed to show a difference in behavioural change between those who were taught didactically and those who were taught to use the goal setting model in a self-directed manner. However, the lack of difference may be due to the survey itself. It may be that the questions asked were not appropriate to demonstrate the hypothesized difference. Future research in the area may yield expected results with a different approach to the survey questions. One

suggestion might be to use the results from the qualitative data to form the questions for a revised questionnaire. Another suggestion would be to pretest the questions to ensure that they most clearly reflect the reality of the participants.

A new topic related to behavioural change is that of the transtheoretical model of change developed by DiClemente and Prochaska (1992). This model suggests that behavioural change occurs in five distinct stages and that people move through these stages in a cyclical or spiral manner. The first stage is termed precontemplation in which there is no intent on the part of the individual to change behaviour in the foreseeable future. The second stage, contemplation, describes people who are aware of a problem and are seriously considering taking action to address the problem. The third stage, preparation, involves both intention to change and some action to implement change. The fourth stage, action occurs when the individual actually modifies behaviour in order to meet his or her goals. At the fifth and final stage, maintenance, behavioural change is complete, and people work to prevent relapse.

Knowing the stage of change that an individual is at may provide clear insights into whether participants are ready to make change, and hence, whether the goal setting model is an appropriate strategy for them. Work with the transtheoretical model as it applies to nutrition is at very preliminary stages. However, in future research of the goal setting model, adding a component to measure stages of change would greatly enhance our understanding of the effectiveness of this model.

Moreover, if any future work was done through interviews, it would improve the research if they were conducted by a third person uninvolved in the program. Here too,

the research would be improved if the questions asked in the interviews were pretested to ensure they provide the information sought.

In summary then, both Dairy Farmers of Ontario and Less-on Lifestyles should continue to use the goal-setting model as a means of helping people to make changes in their food and activity choices.

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Appendix A: Demographic Data

Please answer the following questions to help us with this research

Name _____

Phone (H) _____ (W) _____

Age _____ Sex: Male _____ Female _____

What level of schooling have you completed

Elementary school? _____

Secondary school? _____

College? _____

University? _____

Are you currently employed? Yes _____ No _____

If yes, what line of work do you do? _____

What is your marital status?

Single _____ Married _____ Divorced/Separated _____ Widowed _____

Do you have any dependents living with you? Yes _____ No _____

If so, how many? _____

Have you ever attended a weight loss program before?

Yes _____ No _____

If yes, what is the name of the program? _____

Please describe the program. _____

Appendix B: Pretest Questionnaire

LESS-ON-LIFESTYLES
(Pre Program)

WE WOULD APPRECIATE IT IF YOU WOULD PLEASE TAKE A FEW MINUTES TO
FILL IN THIS QUESTIONNAIRE

1. As you begin Less-On-Lifestyles, do you have a goal in mind that you hope to achieve?

Yes 1 --- PLEASE CONTINUE TO QU. 2
no 2 --- SKIP TO QU. 3

2. What is your goal? PLEASE BE AS SPECIFIC AS POSSIBLE.
-
-

3. Before today had you ever heard of Canada's Food Guide?

Yes 1 --- CONTINUE TO QU. 4
No 2 --- PLEASE SKIP TO QU.9

4. Do you have a copy of the latest version (1992) of Canada's Food Guide?

Yes 1
no 2

5. In the last two years have you made any changes to your eating habits as a result of Canada's Food Guide?

Yes 1 --- PLEASE CONTINUE TO QU. 6
no 2 --- SKIP TO QU. 7

6. What changes have you made? Please be specific.
-
-

7. As far as you know, how many food groups are in Canada's Food Guide?

WRITE IN THE NUMBER # _____

8. Below are some food groups that may or may not be in Canada's Food Guide. Please indicate which you think are in it. Please guess if you are not sure.

Meat.....	1	Dairy products.....	6
Carbohydrates.....	2	Fats.....	7
Fruit/Vegetables.....	3	Sugars.....	8
Milk products.....	4	Pasta.....	9
Cereal products.....	5	Fibre.....	10

9. Here is a list of some food groups. For each one please indicate the number of servings of each group that you eat in an average day. Examples of serving sizes are provided to help you.

Grain products	1 slice of bread, 1/2 cup pasta, 30g cereal	# _____
Vegetables and Fruit	1 medium fresh vegetable or fruit, 1/2 cup frozen or canned, 1 cup salad	# _____
Milk products	1 cup (250ml) milk, 3/4 cup (175ml yogurt), 50g cheese	# _____
Meat and Alternatives	50-100g meat, fish or poultry, 1-2 eggs or 2tbsp (30ml) peanut butter	# _____
Other foods	butter, margarine, mayonnaise, jam, honey, candy, tea, coffee, soft drinks, pickles, ketchup	# _____

YOUR NAME: _____

DATE: _____

THANK YOU FOR YOUR CO-OPERATION.

Appendix C: Posttest

Questionnaire

LESS-ON- LIFESTYLES
(Post Program)

**WE WOULD APPRECIATE IT IF YOU WOULD PLEASE TAKE A FEW MINUTES TO
FILL IN THIS QUESTIONNAIRE**

1. In the course of this program did you write or set a healthy eating goal?

 yes 1 - PLEASE ANSWER QU.2 THROUGH 10
 no 2 - SKIP TO QU. 11

2. Which of the following comes closest to your goal?

To consume more servings of one food group	1
To consume a greater variety of foods within a food group	2
To consume less of a food group	3

3. Which of the groups was it?

milk products	1
fruit and vegetables	2
meat & alternatives	3
grain	4
other foods	5

4. What was your goal? PLEASE BE AS SPECIFIC AS POSSIBLE

5. Is this the same goal that you had when you entered the program or is it a different one?

Same	1 --- SKIP TO QU.7
different	2 --- PLEASE CONTINUE TO QU. 6

6. How is it different from your original goal? PLEASE BE AS SPECIFIC AS POSSIBLE

7. Have you met or are you currently meeting your goal?

yes	1 --- SKIP TO QU.9
no	2 --- PLEASE CONTINUE TO QU.8

8. Why have you not met your goal? Any other reasons?

9. How likely is it that you will repeat this goal-setting process in the future? Would you say you....

definitely will	1
probably will	2
might or might not	3
probably will not	4
definitely will not	5

10. In an average day, how many servings are you consuming from each of the following food groups?

Grain products	# _____
Vegetables and Fruit	# _____
Milk products	# _____
Meat and Alternatives	# _____
Other foods	# _____

11. What was the single most important thing that you learned about healthy eating from this process?

12. In the course of this program did you set a goal to improve your activity?

yes	1 - PLEASE ANSWER QU. 13
no	2 - SKIP TO QU. 17

13. Which of the following best describes your physical activity goal?

to add more activity to your day	1
to do an activity for a longer time	2

14. What goal did you set? PLEASE BE AS SPECIFIC AS POSSIBLE

15. Are you currently meeting your goal?

yes	1
no	2

16. How likely is it that you will repeat this goal setting process in the future? Would you say that you

definitely will	1
probably will	2
might or might not	3
probably will not	4
definitely will not	5

17. What was the single most important thing you learned about physical activity after attending Less-On-Lifestyles?

NAME:

DATE:

TELEPHONE NO:

THANK YOU FOR YOUR CO-OPERATION .

Appendix D: Call-Back Questionnaire

LESS-ON-LIFESTYLES TELEPHONE CALL-BACK

Hello. My name is _____ of _____. We are trying to recontact some of the people who participated in the Less-On-Lifestyles program in _____.

A: Are you _____?

B: Did you participate in the Less-On-Lifestyles program?

IF NOT TALKING TO THE RIGHT PERSON DISCONTINUE

1. Did you set a healthy eating goal during the Less-On-Lifestyles program?

Yes	1 – CONTINUE TO QU.2
no	2 – SKIP TO QU. 8

2. Have you met or are you still meeting that goal?

Yes	1
no	2

3. Since finishing the program have you set a new goal?

Yes	1 – CONTINUE TO QU.4
no	2 – SKIP TO QU. 5

4. What is your current goal? Please be as specific as possible.

5. In an average day, how many servings are you consuming from each of the following food groups? READ EACH OF THE FIVE FOOD GROUPS AND WRITE IN THE NUMBER

Grain products	# _____
Vegetables and Fruit	# _____
Milk products	# _____
Meat and Alternatives	# _____
Other foods	# _____

6. How likely is it that you will repeat this goal-setting process in the future? Would you say you....READ LIST

definitely will	1
probably will	2
might or might not	3
probably will not	4
definitely will not	5

7. What was the single most important thing that you learned about healthy eating from this process?

8. In the course of this program did you set a goal to improve your activity?

yes	1 – ASK QU.9 AND 10
no	2 – END INTERVIEW

9. Are you currently meeting your activity goal?

yes	1
no	2

10. How likely is it that you will repeat this goal setting process in the future? Would you say that youREAD LIST

definitely will	1
probably will	2
might or might not	3
probably will not	4
definitely will not	5

THANK YOU FOR YOUR TIME

Appendix E: Kolb's Learning Style Inventory

LSI

LEARNING-STYLE INVENTORY

McBER & COMPANY

Name: _____

Position: _____

Organization: _____

Date: _____

Inventory

McBer & Company
Training Resources Group
116 Huntington Avenue
Boston, Massachusetts 02116
(617) 437-7080

Learning-Style Inventory: Instructions

The Learning-Style Inventory describes the way you learn and how you deal with ideas and day-to-day situations in your life. Below are 12 sentences with a choice of four endings. Rank the endings for each sentence according to how well you think each one fits with how *you* would go about learning something. Try to recall some recent situations where you had to learn something new, perhaps in your job. Then, using the spaces provided, rank a "4" for the sentence ending that describes how you learn *best*, down to a "1" for the sentence ending that seems *least* like the way you would learn. Be sure to rank all the endings for each sentence unit. Please do not make ties.

Example of completed sentence set:

When I learn:	<u>4</u>	I like to deal with my feelings	<u>1</u>	I like to watch and listen	<u>2</u>	I like to think about ideas	<u>3</u>	I like to be doing things
1. When I learn:	___	I like to deal with my feelings	___	I like to watch and listen	___	I like to think about ideas	___	I like to be doing things
2. I learn best when:	___	I trust my hunches and feelings	___	I listen and watch carefully	___	I rely on logical thinking	___	I work hard to get things done
3. When I am learning:	___	I have strong feelings and reactions	___	I am quiet and reserved	___	I tend to reason things out	___	I am responsible about things
4. I learn by:	___	feeling	___	watching	___	thinking	___	doing
5. When I learn:	___	I am open to new experiences	___	I look at all sides of issues	___	I like to analyze things, break them down into their parts	___	I like to try things out
6. When I am learning:	___	I am an intuitive person	___	I am an observing person	___	I am a logical person	___	I am an active person
7. I learn best from:	___	personal relationships	___	observation	___	rational theories	___	a chance to try out and practice
8. When I learn:	___	I feel personally involved in things	___	I take my time before acting	___	I like ideas and theories	___	I like to see results from my work
9. I learn best when:	___	I rely on my feelings	___	I rely on my observations	___	I rely on my ideas	___	I can try things out for myself
10. When I am learning:	___	I am an accepting person	___	I am a reserved person	___	I am a rational person	___	I am a responsible person
11. When I learn:	___	I get involved	___	I like to observe	___	I evaluate things	___	I like to be active
12. I learn best when:	___	I am receptive and open-minded	___	I am careful	___	I analyze ideas	___	I am practical

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Appendix F: PET Type Check



TYPE CHECK

INSTRUCTIONS:

The PET Type Check gives you an opportunity to increase your knowledge and understanding of yourself. It indicates how you differ from others and what you have in common with others. Rather than put a label on you, it will point out your uniqueness and individuality. Through the PET Type Check, you will become more aware of how you perceive yourself and the world, and of how you make judgments about your inner and outer life.

*On the next two pages you will find a list of statements. On the separate Tally Sheet, please indicate the degree to which each statement describes **you**.*

SCALE

NO!	no	yes & no	yes	YES!
------------	-----------	---------------------	------------	-------------

1. My thinking is positive and productive.
2. I need time alone to think things through.
3. I love to make friends.
4. My true motives I keep to myself.
5. I enjoy action sports.
6. I appear calm, but I experience what I see and hear intensely.
7. I constantly look for new opportunities.
8. I love to contemplate inner images.
9. Whether I see something as beautiful is determined by reason and logic.
10. I can be clumsy in presenting my arguments even though they are clear to me.
11. My feelings are in harmony with those of others.
12. I am mostly silent and hard to understand.
13. Others think I dress well.
14. I have trouble understanding myself.
15. I approach novel ways of doing things with great enthusiasm.
16. I have little influence because few comprehend what I say.
17. When I am sure I am right, I will impose my judgments on others.
18. I react badly to criticism of my ideas and convictions.
19. I value what others value.
20. I rarely reveal myself.
21. Concrete experiences are more important to me than abstract ideas and values.
22. Others tend to abuse me.
23. I am compelled to run after every new possibility.
24. Others often misinterpret my visions of the future.
25. I tend to dominate others when the truth is at stake.
26. I pretend to be nice to people so that they don't bother me.
27. I would adjust my views to avoid conflict.
28. My feelings are intense but unexpressed.
29. I trust what I can see and touch.
30. I see a personal meaning clinging to physical objects.
31. I can bring my visions to life.
32. The present means little to me.
33. I put logic and truth ahead of others' feelings.
34. I can become isolated from others because of my ideas.
35. If others disagree, I am ready to give up my own ideas.
36. I have deep feelings that no one can see.
37. I notice someone's hairstyle or dress.
38. Others can dominate me.
39. I see things as they could be rather than as they are.
40. I neglect my ordinary physical needs.

SCALE

NO!	<i>no</i>	<i>yes & no</i>	<i>yes</i>	YES!
------------	-----------	---------------------	------------	-------------

41. I can be harsh in fighting for my ideals.
42. It annoys me when something interrupts my thought process.
43. I easily accept what others call beautiful or good.
44. I avoid large gatherings because my feelings get overwhelmed.
45. I enjoy material things.
46. I hear and see objects around me in a very personal way.
47. I persistently search for fresh possibilities.
48. I muddle through life.
49. I am outraged when somebody violates logic.
50. I like to create theories for their own sake.
51. I can truly relate to others.
52. When too much happens at once my feelings get numbed.
53. I am motivated by possessions and wealth.
54. My intense way of seeing things can alienate me from others.
55. I am seen as an initiator of new things.
56. Some consider me a dreamer.
57. My actions are based on reflective thinking.
58. I can get totally absorbed in my own thoughts.
59. I reject thinking that disturbs my feelings.
60. At times I pretend to be naive.
61. The here-and-now interests me more than what could be.
62. I see the background of the physical world rather than its surface.
63. I have a sixth sense for things in the making.
64. People have trouble understanding how I see the future.
65. I hate it when I deviate from rational principles.
66. I like to be left in peace to pursue my own ideas.
67. I am consistently guided by my feelings.
68. I appear indifferent to people I don't know.
69. My actions are based on facts rather than speculation.
70. I can get stuck in a rut.
71. I get others excited about what could be.
72. I am a lone voice.
73. My strength is to analyze others' ideas.
74. My judgments appear completely logical to me.
75. I have a genuine feeling of rapport with others.
76. I present myself as self contained and reserved.
77. I love parties.
78. I am oriented simply by what happens, without immediate judgment.
79. I am spellbound by what may be.
80. I can get lost in fantasies.

Appendix G: Survey Questions

Interview Questions

Must start by addressing how the information will be used:

“ Well, _____ I just want you to understand before we get started that the point of this interview is to get a better understanding of your perceptions of the goal-setting model. I don't want to miss anything that you say, and I don't want to take the chance of relying on my notes alone and miss something that you say or inadvertently change your words somehow. So if you don't mind I will use the tape recorder. If at any time during the interview you want to turn it off, feel free to do so.

I also want you to know that I will not be using your name when I report on this interview. I will use your initials only so that your answers will be completely confidential.

I have a number of questions to ask you but I hope to keep this interview to within the time frame of an hour.

- 1. Tell me about one change that you have made in your eating habits or activity level since attending Less-On Lifestyles.**
- 2. How did it go? Were you successful?**
- 3. What went wrong?**
- 4. What markers did you use to decide to make the change?**
- 5. What kept you on track?**
- 6. How did you feel about making this change?**
- 7. Is there anything that would have helped you to be more successful?**
- 8. Can you describe for me what was the most valuable thing you learned about setting goals.**

Appendix H: Goal-Setting Sheet

Setting my Goal

This is my goal for the week of: _____

My goal for this week is:	Be specific when you write your goal: <ul style="list-style-type: none">• Say exactly what you will do.• When you will do it.• Where you will do it.• How often will you do it.
I will need these things to help me reach my goal:	What things, people or situations can help you reach this goal? <ul style="list-style-type: none">• Who can help you with your goal?• What things do you need to buy or use to reach this goal? How can you make sure these things happen?
To reach my goal, I must be aware of these obstacles:	What things, people, or situations might prevent you from reaching your goal? What can you do to make sure that doesn't happen? What can you do to deal with these things if they?

How Successful Was I?

At the end of the week, measure your success in attaining your goal.
Find out what worked, and what got in the way.

How successful was I in reaching this goal?	<p>Were you successful in reaching your goal every day?</p> <ul style="list-style-type: none">• If so, Good for you! Keep up the good work.• If not how many days were you successful?
These factors helped me reach my goal:	<ul style="list-style-type: none">• What were the factors that helped you reach success?• How can you make sure these things continue to happen?
These things hindered me from reaching my goal:	<ul style="list-style-type: none">• What factors prevented you from reaching your goal?• How can you change or eliminate these things in the future?